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Noah's Ark and the Great Eastern Steamship

A correspondent of the London *Times* makes a comparison between the dimensions of Noah's Ark and those of the Great Eastern steamer now building on the Thames. He comes to the conclusion that, both in respect of superficial area and stowage room, the steamer will be larger than the Ark.

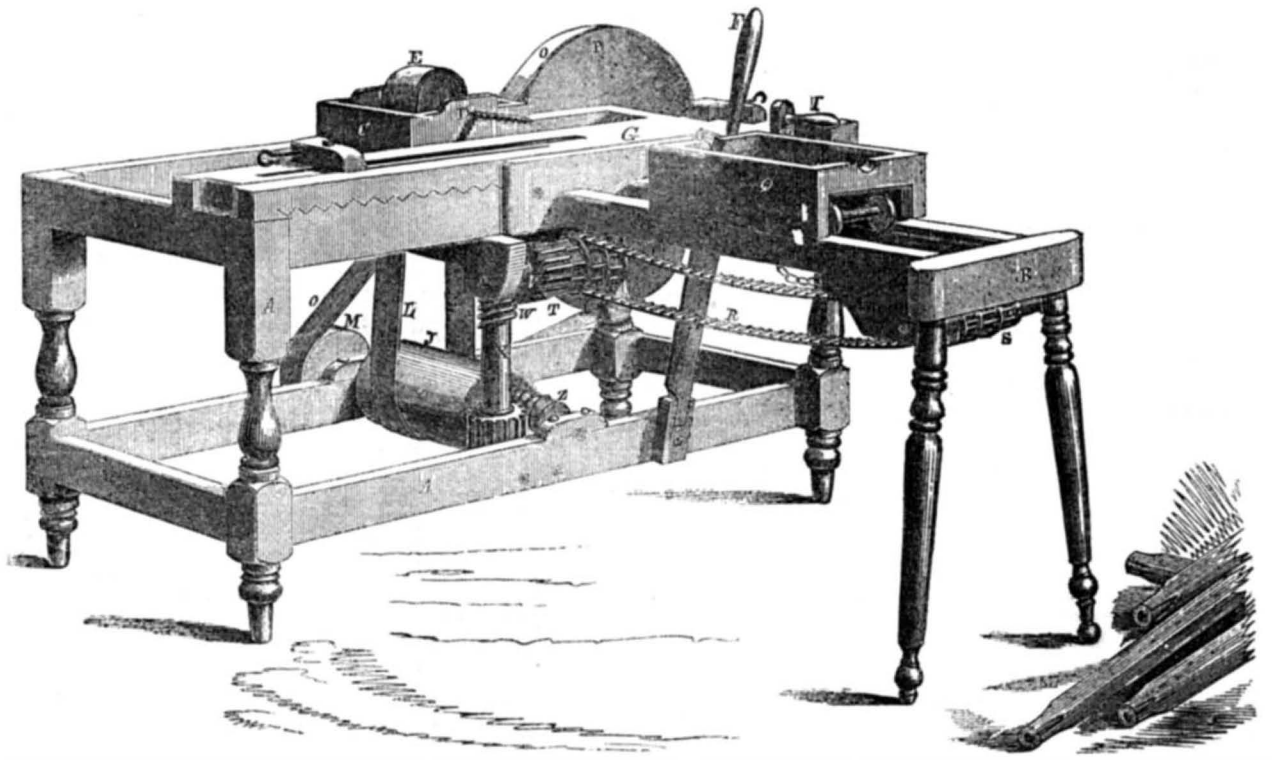
Bad Effects of Snuff.

The Austin (Texas) *Intelligencer* notices the death of a little girl some five or six years old, from the effects of taking snuff. She was so addicted to its use, child as she was, that she literally ate, and lived on it. In our next number we will publish a communication setting forth the poisonous character of adulterated snuff.

Color of the Moon During Eclipses.

Prof. Faye, of the Faculty of Sciences at Nancy, France, observed a fact during the last eclipse of the moon, which serves to explain the peculiar color assumed by the moon when under the shadow of the earth. By covering the part not eclipsed by a distant object, such as the angle of a roof, or the top of a chimney, the tint of the part eclipsed is entirely changed, and in place of a reddish-brown there is seen only a lively rose-red, like that which is so common on clouds near sunrise or sunset, and which gave origin to the epithet rosy-fingered applied to the dawn. The color seen ordinarily in case of eclipse is consequently an effect of contrast, due to the usual yellowish shade of the moon's light.

POST AND PUMP BORING MACHINE.



Post and Pump Boring Machine.

This illustration represents a portable boring machine, patented by Samuel Klahr, of Bernville, Pa., on the 16th of December last. To use many words in setting forth the nature and advantages of a good machine for the familiar purposes of boring posts and pump stocks, would be verbiage. We have but to state its objects, when its extensive application and uses are presented to every mind.

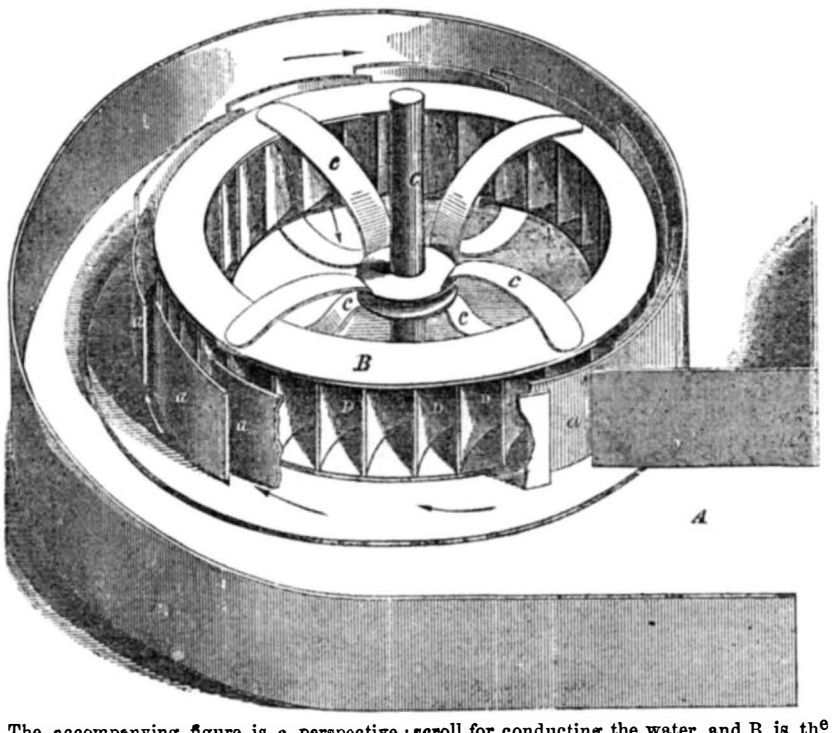
The accompanying description will render the construction and operation of the machine clear to all.

A is a square frame supporting the devices for boring posts, pump stocks, or any long pieces of timber endwise; B is an extension frame attached to frame A; C is a railway carriage resting on the top of the frame, A, it carries the long auger, D. There is a pulley, E, on the auger shaft; F is a lever attached to carriage, C, by which it and auger D, are moved forward whilst boring, or withdrawn at any time from the piece bored; G is a horizontal and adjustable platform to which the post or piece of lumber is attached, and which is moved crosswise, the required distance to regulate the holes apart. The platform, G, has rack teeth underneath which are operated by a pinion below, that is moved by the crank, I. There is a drum, J, on a cross shaft, secured to the frame by journal boxes. This drum, J, causes the auger, D, to revolve by a band, L, passing around it and the pulley E. The pulley, M, is put in motion by a band, O, passing around it and the main driving wheel, P. The carriage, Q, on the frame, B, which carries the pump stock to the auger, D, is attached to an endless chain, R, which passes around pulleys, S and T. These pulleys are of three sizes, and the endless chain is placed over the larger or smaller pulleys, according to the speed required. The pulleys have projecting pins which catch the links of chain, R, and prevent its slipping. The pulleys, T, have a pinion, V, on their shaft, which receives its motion from a vertical endless screw, W, on the upper end of vertical shaft X. This shaft has a pinion at its lower end. An endless screw, Z, on the lower horizontal shaft gears into the pinion on vertical shaft, X, and the endless screw, W, gears into the pinion, V, and thus the pulleys, T, receive their motion.

The post, pump stock, or whatever article is to be bored, is placed on the railroad carriage, Q, which has a recess in its top to hold it. When the boring of the article is executed, the auger is withdrawn as has already been described. There are two carriages in this machine, which have reciprocating motions for feeding and boring the posts and pump stocks. The parts are few and simple and the machine easily operated.

Further information may be obtained by letter addressed to Mr. Klahr, at Bernville, Pa., or P. Buffenmyer, Intercourse, Pa.

MUNROE'S IMPROVED TURBINE WHEEL.



The accompanying figure is a perspective view of an improvement in water wheels, for which a patent was issued to A. Munroe, of Worcester, Mass., on the 22d of July last. The improvement in this class of wheels consists in employing a series of deflecting or guide plates in the scroll, for the purpose of causing the water to act in the proper direction against the buckets. The buckets are concave, and the central arms are inclined plates, which tend to a more free discharge of the water from the wheel to relieve it, after the water has acted on the buckets.

The wheel is horizontal, with a vertical shaft, and is submerged. A represents the scroll for conducting the water, and B is the wheel fitted within it; C is its shaft; *a a* are the oblique guide plates, secured to the scroll, like the slats of a blind, outside of the wheel rim. The water passes from the scroll in the direction of the arrows, between the guide plates, *a*, and acts against the buckets, D, passing through them from the periphery, and discharging at the center. The buckets are of a concave form, placed vertically and tangentially between the upper and lower rim of the wheel, so that their inner ends are closer together than their outer ends. The arms, *c*, secured on a center hub of the wheels are curved and bent upwards and downwards, as shown by the arrow, so as to facilitate the discharge of the water.

The guide plates, *a*, are placed relatively to the buckets, D, so as to direct the water to act against the outer edges of the buckets at right angles with them. The water then passes into the center of the wheel, thence out into two columns, one above and one below, divided by the arms *c*, which, as they rotate, direct the water out in an easy, steady current. In a wheel of four feet diameter, about fifteen guide plates are employed to thirty-five buckets, D. These guide plates or slats direct the water in such a way that if the wheel runs fast, it does not, like some wheels, discharge more water without producing a corresponding effect, but discharges less water, and thus they serve the purpose of self-regulators. One or more wheels may be placed on the shaft. Altogether about fifty of such wheels are now in operation in various places, and give good satisfaction. One of them, at Woonsocket, R. I., performs, it is stated, one-third more work than a breast wheel, with the same water, in grinding meal and flour. We have been shown certificates from some of those who are now running them, speaking in the highest terms respecting their efficiency.

More information respecting rights, &c., may be obtained by addressing Mr. Munroe, as above.

A Gigantic Bird.

The Paris Academy of Sciences has been presented by M. Lartet, Professor at Auch, with three fragments of the shoulder of an unknown bird, dug up in the department of the Gers. The three fragments placed end to end measured fifty-eight centimeters, or nearly twenty-three inches, which is alone about a third more than that of the albatross, which of all known birds, has the largest humerus. Fossil birds are comparatively rare.

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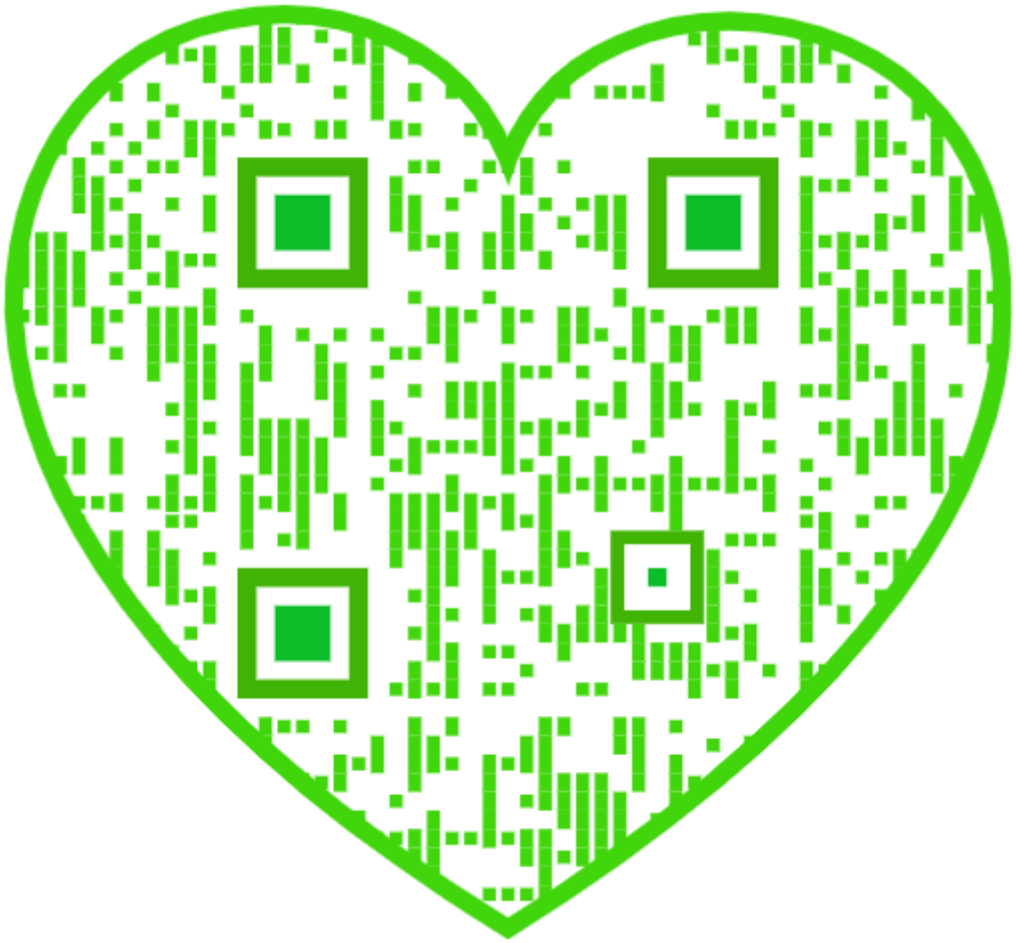

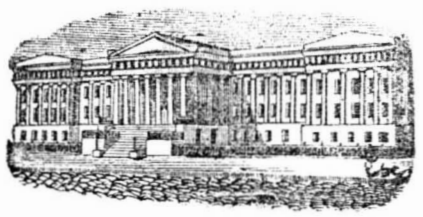

NEW AND IMPORTANT ARRANGEMENTS.

The rapid growth of our Patent Agency Business, during the past three years, has required a great addition to our ordinary facilities for its performance, and we are now able to announce the completion of a system which cannot fail to arrest the attention of all who have business of this kind to transact.

OUR PRINCIPAL OFFICE

will be, as usual, at No. 128 Fulton street, New York. There is no other city in the Union so easy of access from every quarter as this, consequently there are greater advantages in regard to the transmission of models, funds, &c, through the various channels that center in New York. Two of the partners of our firm reside here, and during the hours of business are always at hand to counsel and advise with inventors. They are assisted by a corps of skillful Examiners, who have had many years of active experience in the preparation of cases for the Patent Office.

To render our Patent Agency Department complete in every respect, we have established a

BRANCH OFFICE IN THE CITY OF WASHINGTON,

on the corner of F and Seventh streets, opposite the United States Patent Office. This office will be under the general care of one of the firm, assisted by experienced Examiners. The Branch Office is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington having business at the Patent Office are cordially invited to call at our office.

A SPECIAL REQUEST.

Our facilities for the speedy preparation of cases previous to the application for the patent being much more extensive in New York than at Washington, we especially require that all letters, models and remittances should be made to our address here.

EXAMINATION OF INVENTIONS.

We have been accustomed from the commencement of our business—twelve years since—to examine sketches and descriptions, and give advice in regard to the novelty of new inventions, *without charge*. We also furnish a printed circular of information to all who may wish it, giving instructions as to the proper method which should be adopted in making applications. This practice we shall still continue, and it is our purpose at all times to give such advice freely and candidly to all who apply to us. *In no case will we advise an inventor to make application unless we have confidence in his success before the Patent Office.*

Our extensive experience in mechanical and chemical improvements enables us to decide adversely to nearly one half of the cases presented to us for our opinion, before any expense has occurred in the preparation of the case for a patent.

When doubt exists in regard to the novelty of an invention, we advise in such cases a

PRELIMINARY EXAMINATION

to be made at the Patent Office. We are prepared to conduct such examinations at the Patent Office through our "Branch Agency," upon being furnished with a sketch and discription of the improvement. Our fee for this service will be $5.

After sufficient experience under this system, we confidently recommend it as a safe precautionary step in all cases before application is made for a patent—not that there will be no rejections under the system It is impossible to avoid such results in many cases, owing to the exceedingly wide range taken by the Examiners in the examination of cases; but, nevertheless, many applicants will be saved the expense of an application by adopting this course. Applicants who expect answers by mail must enclose stamps to pay return postage.

THE COSTS ATTENDING AN APPLICATION

for a Patent through our Agency are very moderate, and great care is exercised in their preparation. No cases are lost for want of care on our part in drawing up the papers, and if the claims are rejected, we enter upon a speedy examination of the reasons assigned by the Commissioner of Patents for the refusal, and make a report to our clients as to the prospects of success by further prosecution.

A circular containing fuller information respecting the method of applying for Patents can be had gratis at either of our offices.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, enclosing the official letters, &c.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard Saint Martin, Paris, and 3 Rue Therrsienne, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to inventors. Any one can take a Patent there.

Circulars of information sent free on application.

☞ Remember the SCIENTIFIC AMERICAN PATENT AGENCY, No. 128 Fulton street.

MUNN & COMPANY, Proprietors.

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 5, 1857.

SEWING MACHINES—Bryan Atwater, of Berlin, Conn.: I do not claim forming a loop for a chain stitch and holding it in position to receive the succeeding loop wherein a stationary shuttle is used, as in the patent of T. J. W. Robertson.

But I claim the arrangement described, by which I am enabled to keep the loop of the needle thread positively in position by guides alone, without the necessity of introducing a looper or any other device into the loop, or making the loop pass around a hook or fixed shuttle. That is to say:—

First, I claim the described arrangement of guides for forming the loop from the slack of the needle thread, and directing the same by an external operation to a position for the needle to pass through it, consisting of a stationary guide piece, J, a stationary notched plate or edge, g, and two stationary guides, m m, arranged as specified, in proper relation to each other and to the needle and the cloth, or other material to be sewed, and employed in connection with a proper feeding movement of the cloth or material, to operate substantially as described, and in combination with the said contrivance I claim the guide plate, j, with its lip, l, arranged and operating as set forth.

Second, Though I do not claim the dog, L, operating as described, in connection with an elastic foot piece, K, on the face of the cloth, as in the machine of T. J. W. Robertson, to produce the feeding movement of the cloth, or other material to be sewed, I claim the attachment of the dog, L, to a lever, M, arranged and operated upon by a wiper, q, on the driving shaft, E, as set forth, to produce a quick or sudden feeding movement of the cloth or other material, which shall, at the same time, aid in throwing the loop in the path of the needle, as, and for the purpose specified.

[By the use of stationary guides the slack of the thread after the needle has passed through the cloth and retreated, is formed into a loop, which loop is directed and kept in such position that the needle enters it in its next passage through the cloth, and so on repeatedly, thus forming a firm single chain stitch of a single thread by a most simple arrangement of devices.]

SCREW-CUTTING MACHINES—Wm. N. Adams, of Olmsted, O.: I claim the construction of the branched body, A, the disk, C, sliding fulcrums, E E, levers, D D, and adjustable releasing screw, I, combined in such a manner as to gage the size of screw, and depth of screw thread, and to release the screw as soon as cut to a determinate extent, substantially as described.

STUFFING BOXES—N. R. Bates, of New York City: I do not claim constructing a stuffing box for the purpose of allowing a lateral motion of the piston, as that has been done before.

But I claim the combination and arrangement of the plate, F, with the wires, H H, surrounding it, and the screw rods, I I, and nuts, J J, as described, for the purpose of compressing evenly around the piston the packing as it wears.

[An annular plate placed in this stuffing box is so connected with the packing that the latter can be easily and nicely adjusted, as it wears, around the piston rod, by turning screw nuts in the plate. It is a very simple and convenient arrangement for adjusting the packing and keeping the box steam tight.]

LOOMS FOR WEAVING PILE FABRICS—Erastus B. Bigelow, of Boston, Mass.: First, I claim operating the pile wires by a vibrating staff controlled by a parallel motion, substantially as specified.

I also claim the method of constructing and organizing the hook and carrier for operating the pile wires, substantially as specified.

And I finally claim, in combination with the aforesaid hook and carrier a box or holder, for holding the pile wires in position, and suitably guiding said hook to act thereon, substantially as specified.

CUTTING VENEERS—Gilbert Bishop, of New York City: I claim, first, the arrangement of the knife suspended between the upright frame pieces, A A and N N, at right angles to the log, and giving it a long continuous drawing cut across the log, whatever may be the width of the log, by means of screw, Q", operated in the manner and by the means described.

Second, The horizontal grooved and slotted plate or knife bed, o, attached to the sliding plates, M M' M" M"' held and guided between the uprights, and carrying, supporting, and strengthening the knife in its whole length, and at the same time allowing it a vertical movement for feeding it to the log, as required.

Third, I claim the arrangement of shaft T, the ratchet wheel, 12, the slotted burr and connecting rod, the vibratory bent lever and star wheel, operating and connected together as described, for the purpose of giving motion to the feed screws, m m m' m"', as described.

ADJUSTABLE POLE FOR CARRIAGES—Sherlock H. Bishop, of Orange, Conn.: I claim the method described of adjusting the braces by means of the joints, slots, and eye bolts, when the whole is constructed, arranged, and made to operate substantially as set forth.

BOATS FOR DUCK SHOOTING—Robert Bogle, of Rock Hall, Md.: I claim, in combination with the hull the openings therein, and leggings attached, so that the gunner may propel his boat, substantially in the manner described.

PICKER MOTION FOR LOOMS—Samuel Boom, of Lowell, Mass.: I claim arranging the centralizer and its mortise with the picker staff and its rocker, so as to operate therewith, as specified.

PRINTING SUBSCRIBERS' NAMES ON NEWSPAPERS—Stephen D. Carpenter, of Madison, Wis.: I claim, first, the construction of the cylinder, B, made as described, in sections with flanges, b, to which India rubber or any flexible material is secured for receiving the type, which type are set on the face of the cylinder in columns, as described, for the purposes set forth.

Second, I claim the said cylinder in combination with the platen, operated as described,

Third, I claim the combination of said cylinder with the devices, whereby it is rotated as set forth.

[This invention overcomes one of the difficulties of newspaper operations by printing distinctly, in plain letters, the names of subscribers. The names (in fine type) are set up in several series or rings around a cylinder or drum, so that one drum in a quite moderate sized machine will hold about 5,000 names. The edge of each newspaper is laid on a suitable soft platen, and presented to the wheel, which is rotated the breadth of one line after each impression, so as to print a new name at each movement. Something equivalent to a frisket, with a hole just large enough to allow one name to be printed through is employed to prevent the names on each side from producing any effect on the sheet. This frisket is of brass, very thin on its inner edges, and serves the purpose very efficiently. We consider the invention very admirably adapted to its purpose.]

SURGICAL SPLINT APPARATUS—J. H. H. Burge and Wm. J. Burge, of Brooklyn, N. Y.: First, We claim the combination of the pad straps, R R, with the platform, D, and rod, S, which combination is intended to confine the counter-extending pressure as much as possible to the tuberosities of the ischia.

Second, We claim the rod, U, as a means of supporting the fractured limb, only in connection with the employment of extension and counter-extension.

ROTARY BRICK MACHINES—George Crangle, of Philadelphia, Pa.: I do not claim the manner of supporting nor of operating the cylinder and plungers specified or described, as these have been described and used before in other cases.

But I claim a cylinder, A, without movable bottoms to the molds, in combination with a bed piece, B, fixed to the frame of the machine, so as to serve the purpose of said bottom, the said cylinder, A, and bed piece, B, being constructed, arranged, combined, and operated together, as and for the purpose set forth.

SWELLS FOR MELODEONS, &c—Jeremiah Carhart, of New York City: I claim, first, Providing the swell, E, with a number of holes, and fitting the same with a valve or valves, F, for the purpose of graduating the tone of a portion or the whole of the instrument when the swell is closed, substantially as set forth.

Second, The mechanism for operating the swell valve, F, either while the swell is open or closed, consisting of the upright shaft, I, with its lever, i, and arm, f, and the flexible rod, g, arranged in the manner substantially as set forth.

[This "swell valve" for melodeons enables the player, when the swell is closed, to graduate the tones (loud or soft) at pleasure, and with a remarkable degree of accuracy. The upper notes may be played loud, and the lower ones soft, or vice versa, the same as when a "divided swell" is used, but with the advantage over the divided swell of graduating the tones of each part of the instrument. The improvements are excellent.]

NUT MACHINES—Richard H. Cole, of St. Louis, Mo.: I claim the application of the spring, M, to the sliding punch plates, substantially in the manner and for the purposes described.

PORTABLE FIELD FENCE—Ezra Cole, of Fairhaven, Mich.: I claim the post, B, for use, in connection with picket or panel sections, C C, of a fence, formed of two thin planks, B1 B2, one of said planks being arranged on the one side of transverse sill, A, and the other on the opposite side of the same and one bearing, when the sections are locked together against the inner face of one of the sections, and the other against the outer face of the adjoining section, substantially as and for the purposes set forth.

(This invention, which is clearly defined by the claim, is very simple and ingenious, and enables a farmer speedily to put together the sections of a picket or panel fence in a firm and substantial manner, without the aid of rails, clasps, or any other fastenings, and to take down the same with equal facility whenever he may desire to transport, or use the sections to form a small yard.]

OPENING AND CLOSING GATES—Solomon Cole, of Rochester, N. Y.; I claim the arrangement of levers, a b c, and ways or rails, W W', and tilting pins, P' or n, P or e d m, whereby the gate is not only opened and kept open, but the tilting pins on the other side of the gate are placed in a proper position to tilt the rails and close the gate on the passage of a vehicle.

DOOR BOLT—Jeremiah M. Crosby, of Norwalk, O.: I claim the arrangement of the belt, B, rod, R, and the cam or eccentric, C, combined substantially as described, for the purpose specified.

REAPING AND MOWING MACHINES—Charles Crook, of New Hope, Pa.: I claim operating the cutters of combined reaping and mowing machines by means of the intermediate pinion, J, in combination with the internally geared driving wheel, D, and the spur wheel, D2, on the driving wheel shaft, when the same are constructed and arranged in relation to each other, substantially as and for the purpose set forth.

[This is certainly one of the best improvements made in harvesters for many years. It enables a farmer in a moment by simply shifting a pinion placed between the teeth of the large driving wheel and the teeth of a spur wheel on the shaft of said driving wheel, to so lessen and quicken the speed of the cutter bar as to adapt the machine for cutting grain or grass.]

OMNIBUS COFFER—Joseph T. Curtis, of New York City: I claim the application and employment of a movable transmitting coffer, substantially such as described, in combination with omnibuses and other vehicles, when used in the manner substantially and for the uses mentioned.

STRAW CUTTERS—E. G. Cushing, of Dryden, N. Y.: I do not claim a knie or cutter attached to a rotating disk or cutter wheel, for they are old and well known.

Neither do I claim the feed roller irrespective of the means by which they are operated.

But I claim, first, the disk wheel, E', with cutter, F, one or more attached, in combination with the vibrating head or box, C, in which the feed rollers, D E, are placed, and the "ledger" cutter, d, attached, the above parts being arranged and operating conjointly, as shown and set forth.

Second, I claim operating the feed rollers by means of the ratchet wheel, G, and pawl, H, when used in connection with the vibrating head or box, C, and arranged substantially as shown and described.

[This invention relates to disk wheel straw cutters. The box within which the feed rollers are placed receives a vibratory movement, whereby a greater cutting angle is obtained. By the devices employed a very simple adjustable feed motion is produced, greatly improving this old kind of straw cutter.]

HEATING FEED WATER APPARATUS FOR LOCOMOTIVES—Peter S. Ebbert, of Chicago, Ill.: I claim in combination with the chamber enclosing the heating pipes, the inlet and exit pipes, c d, so arranged as to cause the steam to circulate over, around, or through the heating pipes before it escapes, as set forth and explained.

ICE CUTTING ATTACHMENTS TO VESSELS—Thomas Estlack, of Philadelphia, Pa.: I do not claim separately the share, A, for that, or its equivalent, has been previously used.

But I claim first, The cutters formed of the teeth, e, constructed substantially as described, and attached to the inclined bars, G, which are pivoted to the share, A, as shown.

Second, I claim the share, A, when applied and secured to the bow of the vessel by the chains, D D E E F F, and used in connection with the cutters, the whole constructed and arranged as described, for the purpose set forth.

[This improvement is designed to enable vessels to cut the ice into strips, and thus force a passage through it very effectually, and with great ease.]

PANELS OF PORTABLE FIELD FENCES—Isaac D. Garlick, of Lyons, N. Y.: I claim my improved portable field fence, constructed substantially as represented and described.

PLOWS—Thomas C. Garlington, of LaFayette, Ala.: I claim the combination of headed slide, g, strap, i, brace, D, and key, n, constructed, arranged and operated as described, for performing the double function of bracing the beam and stock, and securing the mold board to the stock.

VAULT COVER—John B. Cornell, of New York City: I claim arranging the respective glasses or tiers of glasses in an illuminating vault cover in inclined positions, to be the straight base of said cover, substantially as represented and described, and for the purposes set forth.

VAULT COVERS—John B. Cornell, of New York City I claim combining a series of gutters, c c, with the under surface of an illuminating vault cover, substantially in he manner and for the purpose set forth.

TRANSMITTING MOTION—Mathaus Kaefer, of Alexandria, Pa.: I claim hanging a loaded fly or balance wheel on a travelling carriage so that said carriage shall yield to the momentum of the fly wheel as it passes the dead points, substantially in the manner set forth.

CUTTING AND BINDING GRAIN—Hiram Kellogg, of McHenry, Ill.: I claim the compresser device formed of the grip rods, g g 2 h, r, standard i, and spring J J 2, in combination with the striker, P, when the same are constructed and operated substantially as described.

NAPPING CLOTH—John C. Millar, of Starrucca, Pa., and C. N Tyler, of Washington, D. C.; We claim, first, the combination and arrangement of two or more napping cylinders, in the manner substantially as and for the purposes described.

Second, We claim the teazling disks, E, or their equivalents, in combination with the cylinders, B, when arranged in the manner and for the purposes substantially as set forth.

Third, We claim the method described of securing the gig rods, a, to the cylinders for the purposes set forth.

BRICK MACHINES—J. W. Jayne, of Sandusky, O.: I claim, first, the radial, sliding and revolving charges, H H H, in combination with the eccentric slot or groove, L, L.' L," L,"' and horizontal mold wheel, E F, said parts being arranged and operating, substantially as described.

I do not claim generally the use of double conveying surfaces for pressing bricks.

Second, The combination of the peculiarly shaped yoke, M M', with the mold wheel, E F, and the sliding and revolving charges, H H H, the whole being constructed and operating conjointly, and arranged substantially as described

TURNING THE EDGES OF CLOTH—J. P. Marston, of Charlestown, Mass.: I claim the combination of the guides, a and B, roller C, guide E, roller I, guide H, and roller L, substantially in the manner and for the purpose specified.

[This machine is particularly applicable to sail-making, but may be employed in other operations. It has a novel combination of guides and rollers for turning over and pressing down the edges of the cloth.]

POCKET SAFES—G. R. McIlroy, of Covington, Ky.; I claim holding the shank of the button between the horizontal spring, a, and the cam c, on the vertical spring, so that by drawing and letting go the rod, d, the said shank will be raised up by the horizontal spring and the cam passing under it, throw it out of the hasp part, as set forth, and this I claim whether one, two or more buttons be used, so long as the series is thrown out by one operation of the rod as described.

SAW MILLS—Daniel and Angus A. Methven, of Wooster, O.: We do not claim any of the mentioned devices separately considered,

But we claim the arrangement of the inclined planes, a a, the connecting rods L, and rock shafts, M, the pawls N, and the double ratched wheels, S S, as specified, in combination with the double toothed saw, operating substantially in the manner and for the purpose set forth.

PLOWS—Jackson Gorham, of Bairdstown, Ga: I claim the foot piece B, having a box, a, at its upper end, and the two flanches, b b, at its lower end, as shown, for the purpose of securing the foot piece to the beam, and the lower end of the brace, C, to the foot piece, as shown and described.

[By this method of constructing plows, their cost is greatly reduced. The foot-piece, B, weighs about 12 pounds, and costs about 60 cents, while the wood work costsonly about 50 cents—total, $1·10. The plow is of very light draft, does not clog, and is an excellent improvement, especially for cultivatiag cotton fields.]

LOCOMOTIVE ENGINES—Horace Gray, of Boston, Mass.: I claim constructing locomotive steam engines with two or more boilers, or with one boiler having two or more separate fire boxes or furnaces connected, and operating on the principle and for the purpose substantially as specified.

PURIFYING GUTTA PERCHA—Robert Haering, of New York City: I claim the method of purifying gutta percha, by means of the ether and alkali used substantially as set forth.

DIRECTING THE EXHAUST OF LOCOMOTIVES—Robt. Hale, of Roxbury, Mass.: I claim the described device for the purpose of leading off a portion of the exhaust steam to heat the feed water, without interrupting or changing the direction of that portion of the exhaust not so employed, in the manner substantially as set forth.

CHAIN PUMPS—James Harrison, of New York City: I do not claim broadly the use of ropes composed of wire, but to the best of my knowledge I believe it is new to combine the buckets of chain pumps with a lifting cord composed of coiled wire, as shown.

I claim the use in combination with the buckets, B, of a lifting cord, A, composed of coiled wire, as described.

[The substitution of coiled wire rope for the chain in chain pumps is an important advantage. The chain does not work smoothly nor snugly in the well box, because it is formed of links, while it is evident that the wire rope must work tight and evenly.]

VIOLIN ATTACHMENT—Andrew Hett, of Augusta, Ga.: I claim the application of the vibrating strings to violins, violincellos, and other similar instruments, in the manner described and for the purpose set forth.

ADJUSTABLE BED AND GAGE—David Hodges, of Suffolk, Va.: I claim the reversible bed with adjustable end guide, c, stationary guide c', and devices for securing the lumber, operating as and for the purposes specified.

SHIPS' HAWSE HOLES—R. R. Osgood, (assignor to Jason C. Osgood), of Troy, N. Y.: I claim supporting a pulley on a rotating bed, and combining therewith a guide tube hinged on its axis for the rope to pass through substantially as and for the purposes set forth.

WRENCHES—Chas. Pinder, of Lowell, Mass: I claim moving, holding, and releasing the movable jaws, B, by means of the double wedge or key, with its inclined planes, e and i, operating against similar ones, j and k, formed in the movable jaw, B, while the lower surface, n, of this wedge, comes in contact with the inclined plane, a, in the groove, E, formed in the wrench bar, A, essentially in the manner and for the purposes set forth.

WEIGHING MACHINES—Rufus Porter, of Washington, D. C.: I claim, first, the combination of the tripping rods, S, with the valve plate, N, and knuckle braces, i and j, whereby the movement of the valve gate, L, (which is operated by means of the scale beams, F,) causes the contents of the buckets, E, to be discharged alternately, as set forth.

Second, The knuckle braces, i and j, in combination with the trap doors, m, whereby the latter are spontaneously closed and fastened immediately after the grain is discharged, as set forth.

COUPLING FOR SHAFTING—William and Coleman Sellers, of Philadelphia, Pa.: We do not claim the use of a conical sleeve within an external sleeve to hold to a shaft,

But we claim the use of two conical sleeves, within one external sleeve, when they are so arranged as to compress the ends of the coupled shafts separately, whether the shafts be of the same or different diameters, substantially as described.

We also claim bolting said conical sleeves together, as described, or in any other mode substantially the same, whereby the bolts may serve as keys to prevent the internal cones from turning in the external sleeve.

LAND FERTILIZER—Charles Stearnes, of New York City: I claim in fertilizers consisting of green sand, marl and animal matters, concentrating their fertilizing and stimulating properties by the previous separation of the useless matters of the marl and disintegration of the green sand, and the superaddition of ammonia, substantially as set forth.

LADIES' SKIRTS—H. C. Traphagen, of New York City I claim the attachment of a series of air tight tubes to the body of a skirt or petticoat, to expand and set out the skirt when the said tubes are filled with air, as and for the purposes set forth.

DOOR SILL AND STRIP—Henry Tryon, of Steuben, Pa.: I claim the construction of my door strip, as shown at C, in connection with the sill, constructed as described, or any other construction substantially the same, and which will produce the same result.

BLIND FASTENINGS—Horace Vansands, of Middletown, Conn.: I claim the attaching of the blind hook by means of a screw or rivet between and in the recess of the two shells or case, as set forth.

COMBING WOOL—Cullen Whipple, of Providence, R. I.: I do not limit myself to the construction and special arrangement of the parts, so long as the peculiar mode of operation described is attained, and the fibres are retained between the teeth of the surface b, while being combed.

Nor do I claim the mechanical parts separately or confine myself to the details described.

I claim the combining machinery as described, whereby the fibres after being fed into or received amongst teeth (set in a suitable surface) have their ends raised out from the teeth, and held by nippers while the ends are cleaned; the cleaned ends of the fibres being then nipped and drawn among the teeth in order to clean the other ends, and also to separate this quantity of fibres from the other fibres amongst the teeth, the protruding ends are then deposited

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amidst the teeth in such manner that they overlap the ends of the quantity of fibres which have been just previously similarly treated, thus admitting of the prepared or combed fibres being doffed or drawn off from the teeth in a continuous sliver, as explained.

INDIA RUBBER BELTING—Robert Hale, of Roxbury, Mass.: I claim the manufacture of machine belting by folding and cementing strips of india rubber cloth by a series of mechanical devices, substantially such as described.

Second, I claim the method described of moistening the seam and applying the india rubber strip thereto, for the purpose set forth.

Third, I claim the manner described of applying the middle for a belt of three or more plys, by means of guides the two being united in the manner set forth.

PHOTOGRAPHIC GROUNDS FOR WOOD ENGRAVERS—Robert Price, of Worcester, Mass.: I do not claim the use of asphaltum varnish and lamp black, or any other varnish or compound when used to produce a pilicle or covering upon surfaces designed for the reception of photographic pictures, as such varnish or pelicle unfits the block for the engraver's use.

But I claim the described varnish, composed of asphaltum varnish, lamp black and ether, when the same is applied to the block by rubbing into its pores in the manner set forth.

SLEIGHS AND CUTTERS—L. B. Randall, of Penn Yan, N. Y.: I claim the parts designated by the letters A, B, C, D, E, F, G, H, I, L, and o, combined as and for the purposes set forth.

FIREARMS—J. B. Read, of Tuscaloosa, Ala.: I claim the providing the upper part of the powder space or chamber of firearms, with angular or wedge shaped projections to be forced into the rear of the projectile in the act of loading, as described.

Also the form of ball represented in my drawings cylindrical at or near its middle portion, with a slight excavation or recess on the inner and under side of the cylindrical part, both ends of the ball to be conoidal or conical.

STAIR STEPS—Charles Robinson, of Cambridgeport, Mass.: I claim beneath each step a spring or springs, so as to give an elastic movement thereto in ascending and descending upon the stairs for the purposes specified.

PIANOFORTE ACTION.—Henry Steinway, of New York City: I disclaim everything described in the letters patent of John H. Morton.

I claim the sliding post, d, and spring g or j, or its equivalent, applied substantially as described, in relation to the jack and key to operate as set forth, in combination with a block, c, on the hammer shank, for the purpose specified.

[By this improvement a more free and easy movement of the action is obtained in repeating, and the hammer can be stopped near the string. An effect is obtained like that produced in the complicated "Erard Grand Action," by very simple devices.]

CYLINDERS FOR PRINTING FABRICS—R. F. Sturges, of Birmingham, Eng., Patented in England, Oct. 16, 1855: I do not limit myself to the precise details herein described and represented, as the same may be varied without departing from the nature of the invention.

I claim the new manufacture of rollers or cylinders for printing fabrics described, that is to say, casting a thick tube of a hard and easily fusible metal or alloy in the interior of a tube of copper or alloy of copper.

CLOTHES POUNDER—Sardis Thomson, of West Otis, Mass.: I claim the bell shaped cylinder, in combination with the piston, piston rod, spring and handle, or other equivalents, to produce the same effect: viz., the cleansing or washing clothes, by agitating the liquid by the pressure of air, substantially the same as described, and to be applied to the purposes set forth.

CLOSE OR OPEN STOVES—Henry Seitz, of St. Marys, Va.: I claim the arrangement in a grate of the plates, O N Q R, supplementary grate bars, i, dust flue, S, air-heating chambers, X X I, and passages, J J, when the whole are disposed as shown, for the purpose set forth.

[By this improvement in open stoves the draft can be increased or diminished as desired, by the "sliding-back.' In stirring the grating the devices employed preven any dust from getting into the apartment—a most usefu arrangement for such stoves, the remedy of a great nuisance in their use.]

LOCKS—Alfred Williams and Edward P. Cummings, of Philadelphia, Pa.: We claim the use of the yoke, c c c, the levers, E F, and the stop lever, H, the whole constructed arranged and operated in connection with the disk, N, as set forth.

GATES OF TURBINE WHEELS—L. M. Wright, of Niagara Falls, N. Y.: I do not claim the parts separately.

But I claim their arrangement in the manner described and for the purposes set forth.

METAL-PACKED PISTONS FOR STEAM ENGINES—Geo. W. Cotton, of St. Louis, Mo.: I claim the arrangement for operation together on a single ring packing, of the wedge, b, with its sliding block, M, and radial stretchers, r, spiral springs, n o, and inner sliding steps or blocks, x, substantially as shown and described.

And I further claim forming the joint or break of the single ring packing with overlapping tongues, g K, and wedget, l, of less depth than the packing, and fitting loosely between the beveled ends of the packing and the tongues, g K, at the top and bottom on opposite edges of the packing ring, as set forth.

COTTON SEED PLANTERS—H. L. Justice and John H Galbreath, of Goodlettsville, Tenn.: We claim the combination of rag wheel, d, having adjustable arms, Z, with the movable hopper, f, of a cotton seed planter, the whole being arranged and operated in the manner set forth.

SECURING HUBS TO AXLES—Leonard J. Worden, of Utica, N. Y.: I claim making on the front end of the skane or bush, A, a neck, C, of peculiar form, that is to say, having two or more parts of its periphery of a cylindrical shape, whilst the remaining parts are both cam-shaped and conical, when used in connection with a nut, A', whose internal periphery corresponds with the external periphery of the neck, C, lock plate, L, or its equivalent, the whole being arranged, constructed, and operating in the manner and for the purposes substantially as set forth.

BRICK MACHINES—James Hotchkiss and William H. Scholfield, (assignors to themselves and Wm. R. King,) of Yellow Springs, O.: We claim the combination of the plungers, H H and I I, with the sliding carriers, G G, and mold wheel, E, when the same are so constructed and arranged as to operate in relation to each other, in the manner and for the purposes set forth.

TURNING CYLINDRICAL WOODEN BOXES—Henry Mellish, of Walpole, N. H., (assignor to Charles Pope, of Brookline, Mass: I claim the cutting tools, H x m t, made with cutters or cutting edges, to operate substantially as specified, to cut and plane the box or box cover.

RE-ISSUES.

TURN TABLES—Jacob C. Robie, of Binghamton, N. Y. Patented Aug. 15, 1854: I claim balancing the platform of the turn table upon a transverse shaft or other suitable bearing or bearings resting upon or connected with the carriage which supports said platform, in such a manner that the table, when in a horizontal position, or thereabouts, is elevated above its under supports or end bearings, to admit of its free swing, and so that the table may be depressed at either end to bring the ends of its rails on either side of the carriage into line or level with the rails of the track, for the purposes set forth.

LOOMS FOR WEAVING BRUSSELS CARPETS, &c.—Erastus B. Bigelow, of Boston, Mass. Patented March 10, 1840. Re-issued Oct 9, 1849: First, I claim, in combination with the pile wire or wires for weaving piled fabrics, a grooved receptacle or trough for holding said pile wire or wires in position whilst being pushed into the shed of the warp, substantially as specified.

Second, I claim pushing said pile wire or wires into the shed of the warps by a driver or pusher, substantially as specified.

Third, I claim guiding and supporting the pile wires as they are inserted into the shed of the warps by a guide or guides, through, over, or on which said wires slide, substantially as specified.

GRINDING AND POLISHING METALLIC SURFACES—Richard M. Hoe, of New York City. Patented May 30, 1842. Extended seven years from May 30, 1856: I do not claim broadly, the use of a rotating cylindrical lap or grinding surface for grinding or otherwise reducing or polishing metallic substances.

Nor do I claim giving to such lap or polishing surface in addition to its rotating motion, or traversing motion in the direction of its axis, or as the equivalent thereof, giving to the substance to be operated upon a traversing motion in the direction of the axis of the rotating lap or polishing surface.

But I claim, in combination with the rotary and traversing motion of a cylindrical lap or grinding or polishing surface, substantially as described, the reciprocating motion of the carriage which carries the plate to be reduced or polished at right angles to the traversing motion of the rotating lap, or grinding or polishing surface, or as the equivalent, a rotary motion, substantially as described.

And I also claim constructing the said grinding or otherwise reducing or polishing surface of a series of plates of any suitable substance, with spaces between the several plates, substantially as and for the purpose specified.

DESIGN.

STOVES—Jacob Steffe, James Horton, & John Currie, (assignors to F. H. Church,) of Philadelphia, Pa.

Mechanics' Hand Books.—The Weight of Coal.

MESSRS. EDITORS—Those who prepare books of reference for mechanics and civil engineers should be careful in their figures and accurate in their statements, or they become but blind leaders of those they profess to guide. The error of a single figure in a text book in common use may involve vast interests, and cause the loss of thousands of dollars. I am a civil engineer by profession, and have occasionally been led into serious errors by the inaccuracy of works esteemed good authority; and I wish now to point out one glaring error which I have discovered, in the hope that it may lead to a general overhauling of the books. Having had occasion recently to calculate the weight of a cubic yard of coal, or the number of tuns which a vein of a given thickness will yield per acre, I referred to a work called the "Engineers' and Mechanics' Pocket Book," by Charles H. Haswell, and published by Harper & Brothers. On page 225 of the eighth edition, the weights of many different bituminous coals are given, the heaviest of which (the Cumberland coal) is stated to be fifty-four pounds per cubic foot, omitting fractions. Now the weight of a cubic foot of water is one thousand ounces, or sixty-two and a-half pounds. Does Mr. Haswell mean to intimate that coal is lighter than water? The statement professes to be taken from the report of Prof. W. R. Johnson, made in 1844. I cannot believe that Prof. J., who made his report from actual experiments for the United States Government, ever put forth such a statement; and it is not a mere misprint, for the weight of many other bituminous coals are given as still lower, so that the error would seem to be with the author. It may seem but a small matter, but in this case it involved very heavy interests.

You will say, perhaps, that an engineer should be able to verify the correctness of the figures in his text books. This may be so; but if we must in all instances ascertain by observation and experiment the correctness of the authorities who profess to guide us, then books of reference are useless, unless we make them ourselves. D. S. GREEN.

Ralston, Pa., May, 1857.

[We have given place to the above letter for several reasons. Our correspondent has recently calculated the weight per cubic yard of coal, and his calculations *involved heavy interests.* He condemns the assumed weight per cubic foot of coal, as given in Mr. Haswell's book, therefore his calculations must have been based on a different *unit* of weight per cubic foot. But if Haswell's book is wrong, Prof. Johnson was wrong, for assuredly Haswell is perfectly correct in his authority. On pages 590, 591, and 592 of Professor Johnson's report alluded to, the weight per cubic foot of a great variety of coals is given, and they are all lighter than water. The heaviest is Beaver Meadow, Pa., 56·19 pounds per cubic foot. Has our correspondent then, made a wrong calculation? Not likely. But he judges Haswell's book as referring to coal in the mine, whereas it quotes Johnson as referring to broken coal, the kind employed for steam boilers. In Johnson's report it is stated (page 62) that the calculated solid foot of coal in the mine is 92 lbs., in the condition of lumps 53 pounds. It was an error in Prof. Johnson to give the weight of a cubic foot of coal broken in lumps, because it is liable to lead to mistakes, and is unavoidably inexact, as there is a difference of several pounds in the weight of a cubic foot of small and large lump coal—the small weighs most.

Our correspondent is perfectly correct in his allusions to incorrect hand books for engineers and mechanics. Unless they are positively reliable they are worse than useless, as they go forth the propagators of error. A wrong statement in one number of a periodical can be corrected in a subsequent issue; but it is far otherwise with a book, a second edition of which may never be published, or only at a very extended period of time from the first.

One Hundred Tuns of Grass to the Acre.

MESSRS. EDITORS—The statement you published, taken from an English paper, respecting the raising of one hundred tuns of grass on a single acre of land pertaining to Lord Derby's estate, is undoubtedly correct, or very nearly so. I had the pleasure of visiting his Lordship's estate last summer, while on a tour of agricultural observation in England, and I am prepared to believe the statement. My visit was made about the first of June, and they had already secured *two* heavy crops of grass, and it is not improbable that four or five more were cut during the long and favorable season of last year. Four or five crops of the heavy, stout, Italian rye grass is not unusual; and Mr. Mechi, of the celebrated Tiptree Farm, informed me that he had once grown *seven* during the summer. This grass grows with great rapidity in England when stimulated by the rich liquid nutriment so liberally and continuously applied.

Our farmers have yet much to learn respecting the scientific cultivation of the soil. They have yet to learn how bountiful mother earth may be when properly dressed and cared for by the husbandman. It should be observed that the climate of England is much more favorable for the growth of the grasses than our own, owing to its excessive humidity; but still, I do not know why several successive crops may not be produced here by the use of liquid manuring, and by careful systematic culture. JAS. R. NICHOLS.

Haverhill, Mass, May, 1857.

A New Science.—Hydroscopy.

Joseph Gautherot, a mining engineer in France, distinguished by a peculiar talent of observation united with an extraordinary perseverence in investigations of geological strata, has discovered a law of nature which enables him, by examining the features of the surface to direct where subterranean sources of water are to be found. Thus he pointed out the places of digging wells to such an extent that he was honorably rewarded in 1846 by the French Government for his beneficial services to different communities. In the district of Haute Maine a well was thus dug, yielding 12,000 litres of water per hour. The French Government has recently appointed him for Algiers, where at different cities wells are now dug out with the best result; and he is considered among the Christians, Mohammedans, and Jews as a second Moses in the desert.

L. R. BREISACH.

Simple Butter Cooler.

Melted butter is all very well in its right place, but when butter is put upon the tea or breakfast table, having the appearance of being just out of the oven, it is anything but creditable to the housekeeper, and far from satisfactory to those who eat it. Dry toast is positively spoilt if spread with soft butter; indeed, if butter cannot be brought to table at least firm, if not hard, it is better to keep it away altogether. Fortunately, however, it is not necessary to proceed to such desperate measures, as butter can be kept nice and cool in the hottest weather, and that in a very simple manner. Procure a large, new flower-pot of a sufficient size to cover the butter-plate, and also a saucer large enough for the flower-pot to rest in upside down; place a trivet or meat-stand (such as is sent to the oven when a joint is baked) in the saucer, and put on this trivet the plate of butter; now fill the saucer with water, and turn the flower-pot over the butter, so that its bottom edge will be below the water. The hole in the flower-pot must be fitted with a cork; the butter will then be in what we may call an air-tight chamber. Let the whole of the outside of the flower-pot be then thoroughly drenched with water and place it in as cool a spot as you can. If this be done over night, the butter will be as "firm as a rock" at breakfast time; or, if placed there in the morning, the butter will be quite hard for use at tea hour. The reason of this is, that when water evaporates, it produces cold; the porous pot draws up the water which in warm weather quickly evaporates from the sides, and thus cools it, and as no warm air can now get at the butter it becomes firm and cool in the hottest day.

SEPTIMUS PIESSE.

Notes on Science and Foreign Inventions.

New Electro-Magnetic Engine.—A scientific commission has been appointed by the Emperor of the French to test a new electro-magnetic engine, recently brought to Paris by T. Allan, of Edinburgh. This engine has been at work for some time at the engineering establishment of M. Cail, Paris, and with such success that it has inspired much confidence in its economy. It is to be applied to a locomotive at the expense of the French Government, in order to give it a most thorough test. Such at least, are the reports made public respecting it. If Mr. Allan renders an electro-magnetic engine successful, and as economical as a steam engine, he will do something which has been considered an impossibility. Such engines have already been constructed as locomotives both by Davidson in Scotland, and Professor Page in our country, but they were far from being as economical as the *steam horse.*

Copying Inks for Printing.—It has always been held to be a desirable object for some purposes to obtain an ink partly soluble in its character for printing, which can be transferred or copied in the same manner as written letters. For such an ink a patent has lately been obtained by J. Underwood and F. V. Burt, of London. The patentees, in making a black ink, take of nutgalls 14 lbs., of sulphate of iron 6 lbs., of soap 3 lbs., of gum senegal 12 lbs., of thick molasses 6 lbs., of lamp black 6 lbs., of Prussian blue 3 lbs., and of filtered rain water 15 gallons. The nutgalls are first bruised, and then boiled for about three hours, more or less, in half the above named quantity of water, and the clear liquid drawn off. The gum and sulphate of iron are separately dissolved in the remaining quantity of water, and the whole is then mixed with the decoction of nutgalls, and exposed for about twenty-one days, more or less, when the supernatant liquid is drawn off from the deposited matters and sediment. The molasses and soap are now added to the liquid thus drawn off, and the whole evaporated in a water bath to nearly the consistency of ordinary printing ink, and then the lamp black and Prussian blue are mixed with it. The above ingredients will form a black ink; but ink of other colors may be made by using soluble coloring material or materials, such as sulphate of indigo, or carmine dissolved in ammonia, either separately or combined with coloring matter such as now employed in the manufacture of colored printing inks, in lieu of the nutgalls, sulphate of iron. lamp black and Prussian blue used in making ink as described.

Purifying Petroleum.—A few weeks since, we referred to the purifying of this natural hydrocarbon fluid, which is obtained in many parts of our country in great abundance from wells, and we stated that an invention which would render it fit for burning in lamps would be very valuable. We perceive by the London *Engineer* that a patent has been taken out for this purpose by S. White, of Liverpool. The process is not fully described, but it is stated he uses common salt, neutral chromate of potash, sulphuric acid, copperas, and carbonate of soda, in combination, as purifying agents. He distills the petroleum three or four times according to circumstances, and has all the stills going on from the first to the last in one continuous process, from the crude to the finishing operation.

The Directors of the Mint have arranged with the Adams Express Company for the transportation of the new cent coins to all points of the Atlantic States.

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New Inventions.

Reaping Machine Challenge.

Baron Ward has given notice to the Imperial Agricultural Society of Vienna that he challenges all Reaping Machines—European and American—to compete with his, (an improvement on Hussey's, patented in October last in Austria,) for one thousand florins, in cutting seven acres, next harvest. The trial is to take place in the Austrian dominions, and those who accept the challenge have the choice of cutting either wheat, barley, oats or clover, the prize to be awarded to the one which does the work in the shortest time, and in the best manner. This challenge has been published in the London *Times*. The agents of American reaping machines in Europe, we suppose, will take care of it.

Electric Illumination.

A few weeks since, some experiments on electric illumination were made at Paris, surpassing all that had before been done. The success was due to an electric regulator invented by MM. Lacassagne and Thiers, called by them an electro-metric repeater. The inventors placed four of their lamps on the Arc de Triomphe de l'Etoile, and projected the light at night on the Champs Elysees, towards the Place de la Concorde, and a second on the avenues of Neuilly or de l'Imperatrice, the change having been made because of the numerous gas lights of the Champs Elysees. These gas lights were made to look dull and smoky, yet diminished the effect of the electric light; but in the avenues of l'Imperatrice the lights presented intense brilliancy.

Each lamp was sustained by means of sixty of Bunsen's pairs, and furnished with a spherical reflector of metal, or of glass silvered by a battery.

Nautical Telegraph.

In place of the common light used as a beacon and for signals aboard ships, Mr. Treve, of Paris, proposes to substitute a simpler system more easy of execution. It is based on the use of illuminating gas light by a galvanic current of induction. The lamp at the mast head receives the gas through a tube of vulcanized caoutchouc having a spiral of copper wire within, and covered exteriorly by some impermeable material; it terminates on the deck where the gasometer is placed. By stop-cocks, the gas can be let in at will. A Ruhmkorff's apparatus is used for inflaming the gas; two wires covered with gutta percha pass to the upper lamp. These wires branch off and are attached to the shank of each of the other lamps; and are so arranged as to give a spark at the beak of each burner. As the light will take place only at the beaks supplied with gas, the lights may be varied for signals by means of stop-cocks, any or all of the lamps being lighted or extinguished at will.—[*M Jerome Nickles, Paris Correspondent of Silliman's Journal.*

Street Sweeping Machines.

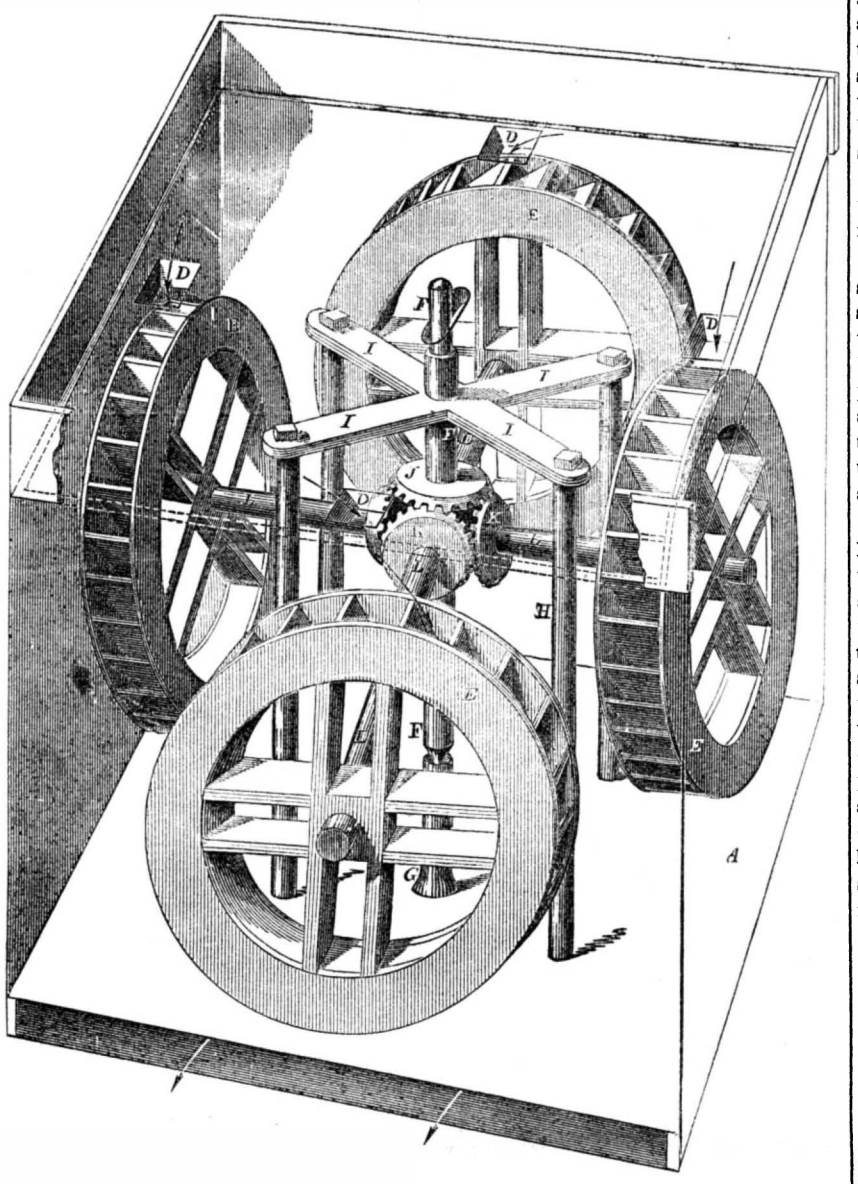
A company in this city undertook to clean the streets by contract, and intended to employ street sweeping machines for this purpose. Some machines were set to work, but, owing to a dispute, as we have been informed, between the makers of the machines and the street contractors, they have ceased to be used. We have no doubt but in a few years from the present date all our large cities will employ machines exclusively for street cleaning. One machine has recently been employed in Philadelphia, and has given satisfaction—doing more work than twenty men. It is nearly ten years since we urged upon the authorities of all our cities to adopt machines for street cleaning, to sweep and repair the streets during night hours, and to lay down the Belgian pavement. These several municipal improvements are gradually coming into general use, but not quite fast enough to please us.

Rifle Percussion Shell.

Capt. Norton, of England, has invented an explosive shell for common rifles, which can be used with safety, and is highly spoken of by our foreign cotemporaries. At some future period we will give a full description of it.

HELLER'S QUADRUPLE WATER WHEEL.

This illustration is a perspective view representing four overshot wheels so combined and arranged as to transmit their united power to one vertical shaft. In a close square flume or box of requisite size are secured the four wheels, E. The water is admitted to each through a gate, D. F is the main central shaft resting upon a step, G. There are four posts or supports, H, which have arms, I I, supporting the central shaft. J is a bevel wheel on shaft, F, gearing with bevel wheels, K, on the horizontal axles, L, of the four

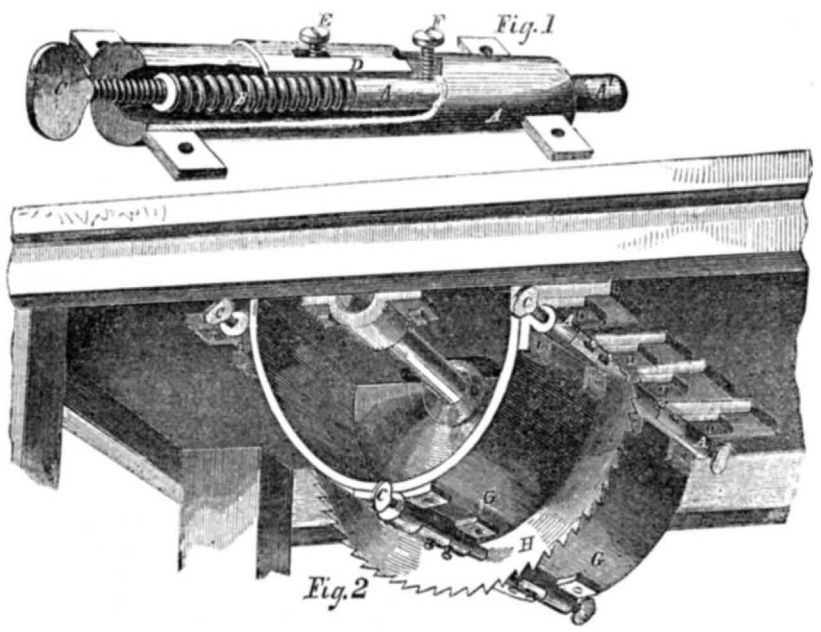


water wheels. The outer ends of these axles run in journals in the sides of the box; at the center they are supported on a framework. The water is discharged from the bottom of the box, or the tail-race, as shown by the lower arrows. The combination of these wheels, as represented in the figure, with a part of the box removed, renders the whole arrangement clear to every person.

A patent was issued for this arrangement and combination of wheels on December 16, 1856, to John Heller, and called a "Quadruple Water Power." The object of the invention is stated in the specification to be "to avoid the friction caused by the pressure against the one side of the shaft, which tends to deflect it from a perpendicular line in the operation of a single wheel."

More information may be obtained by letter addressed to Mr. Heller, Binkley's Bridge, Pa.

GUIDES FOR CIRCULAR AND OTHER SAWS.



On the 8th of July last a patent was granted to Orrin Rice, of Cincinnati, O. for the improvement in guiding circular and other saws, illustrated by the accompanying engravings. The first, fig. 1, is a perspective view of a spring guide peg; the second, (fig. 2,) an under side view of a table and circular saw, showing the application of three pair of guide spring pegs. The nature of the invention consists in the mode of applying a spring peg, or any number of such pegs with screws attached, so as to increase or decrease the pressure on the saw, according to the requirements of the case, to be applied to one or both sides, either single, double, or in pairs, to circular or other saws, in sawing timber of any kind.

A represents a hollow tube, closed at the back end to confine a spring, B, to be operated by the thumb screw, C, for strengthening or weakening the spring pressure, according to circumstances. The front ends open to admit a wooden peg, A', into which screw pins, E F, are inserted through slots, as shown in fig. 1, to prevent the peg from being pressed by the spring and thumb screw beyond a fixed limit, to keep the saw in line. G G is an arch or bridge constructed according to the size of saw, for placing one, or any number of springs with pegs or bolts of an anti-heating character, near the circumference of the same, as represented in the figure.

The common circular saws employed in sawing logs are made of very thick plate steel, to prevent buckling and springing; they therefore cut a wide kerf, and waste the timber. The application of these guide spring pegs, as shown, supporting and strengthening a thin saw, prevent the waste of from one-third to one-half the kerf of a thick saw, thus effecting a great saving in sawing valuable kinds of timber.

There is also another objection to using large circular saws for sawing logs into square timber or boards. The saw presents so large a surface to the log that the least spring sidewise in the log while the saw is running through knots, knarls, or crooks, is liable to spring and buckle it, unless it can move sidewise, so as to accommodate itself either way to the spring of the log. This improvement obviates this difficulty by placing the spring peg, as shown, on each side of the saw, exactly opposite each other, leaving the mandrel unconfined by shoulders, so as to give lateral or endwise motion; the saw is held steady, and at the same time permitted to move easily either way, more or less, according to the spring of the log.

The saw is also brought easily back in line by the pressure of the peg on the side furthest from the line, and lightly on the other side, directly below where the saw first strikes the log. It will be understood that these guide pegs or bolts are placed on the underside of the table, the upper half of the saw being, as usual, free and unconfined to operate on the log. This improvement appears to be an excellent one in every respect.

More information may be obtained by letter addressed to Mr. Rice, as above.

Perpetual Motion.

The original perpetual motion man—the *bona fide* inventor—E. P. Willis, of New Haven, Ct., has arrived in this city, and put up four of his remarkable machines in the American Museum, where they are now on exhibition as puzzlers to the curious, cute and cunning in such matters. One of the machines is similar in its construction to the one illustrated on page 201 of our last volume. The three others are different. One is a magic clock; the other an electric wheel, and the fourth four revolving brass balls on a glass pedestal. They move apparently as if they possessed the power of motion in themselves. We are no believers in perpetual motion, for such a thing is impossible; but for rare, skillful specimens of mechanism, Mr. Willis has shown him himself to be an original genius, and his machines are well worthy of examination on this account.

The Maynooth Battery.

An inquiry having been made as to the character of the above named galvanic battery mentioned in our last number, we will describe it for the benefit of all those who may wish to construct the cheapest battery yet brought out. It is the invention of Professsor Callan:—

Taking advantage of the remarkable passivity of cast-iron, in relation to a mixture of strong nitric and sulphuric acids, he constructed his apparatus with cast-iron cells, in which a porous porcelain cell, with a zinc plate is inserted. The latter contains dilute sulphuric acid; the former a mixture of the two acids just mentioned. This is a powerful galvanic apparatus.

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Scientific American.

NEW YORK, MAY 16, 1857.

Ocean Steam Navigation.

Twenty years ago, all the trade between America and Europe was carried on with sailing vessels, and the smoke from the funnel of a steamship on the Atlantic was then as great a curiosity as a volcano. Since that period a great change has taken place in the character of our ocean commerce. Then this trade was almost confined to American ships; now steamers engross more than two-fifths of the Atlantic commerce, and they are rapidly increasing in number.

There are no less than thirty steamships now running between New York and different ports in Europe. These are regular steamers carrying passengers and merchandize, beside which there are a number of transient ones, not included, that carry cargo only. But ten of them are American vessels, while the Boston, Portland, and Philadelphia lines are entirely European. The Atlantic trade is departing from us, and unless our shipping merchants exhibit more practical wisdom and enterprise they will ultimately be vanquished in this contest. When we consider that in 1838 the entire carrying, postal and passenger trade between New York and Europe was transacted in American vessels, and that more than one-third of it has already passed into British steamers, it is not difficult to predict what the result will be if this kind of work goes on for twenty years longer.

The whole number of steamships engaged on the routes between Philadelphia, New York, Boston, Portland, Halifax, and Quebec, on this side of the Atlantic, and the ports of Havre, Bremen, Hamburg, Southampton, London, Liverpool and Glasgow on the other side, is fifty-one. Of these only seventeen have paddle wheels, all the others—thirty-four—are screw propellers with iron hulls. Our marine engineers have been very unfortunate in their attempts at constructing ocean propellers, for although several have been built, not a single one belongs to the above large number—all being European. They are the most economical of steamships; their steam power is but small in proportion to their tunnage; they make very regular and quick passages, carry large cargoes, charge but little more for freight than sailing vessels, and merchants prefer them for carrying goods. These are the steamers that are fast "routing out" our sailing craft in the Atlantic trade.

When we look at these facts, we feel this to be a serious matter, and urge our merchants to give it earnest and careful attention. We are confident that wooden ships can be built as cheap here as iron ones in England, and since propellers have proved so successful under the management of European companies, it is our opinion such vessels may be managed with equal success in New York. Will our merchants and nautical men succumb to their rivals in Atlantic ocean commerce, after they have for years been masters of it? If they do, we mistake their spirit. But then they must not slumber long over this matter; it is high time they were actively at work to recover their lost prestige, and regain their lost business. The longer they delay the weaker and less able will they become for the struggle, while their rivals will be "growing stronger and stronger," and increasing in wealth, power and influence.

In connection with this subject, let us point them to an example worthy of their emulation. We have been informed that nearly all (if not all) the foreign steamers of the number stated above were built in Glasgow, and that the majority of them are owned by merchants of that city. These men apparently know what they are about; they are competing with us for the supremacy of the Atlantic trade. They have built ten steamships for every one we have during the past four years, and their success does credit to their ability and energy. Our shipping merchants have a high and honorably won reputation for enterprise—let them look these statements calmly in the face and speak in deeds.

Management of the Flax Crop.

We are satisfied that our farmers have a very imperfect knowledge of flax agriculture; and we are equally satisfied that they *may* raise profitable flax crops. No fabrics are more beautiful than those of fine linen; they are dearer than the finest silks. We have a spool of yarn in our possession made from Belgian flax, and although it is not the finest made, one pound of it will extend forty miles.

No fine flax has yet been raised in the United States, and never will, unless great attention is paid to the culture of it. Some kinds of flax are sold in Belgium as high as $1,000 per tun, while the lower grade of Baltic flax is not worth more than $200. The difference in the price of the two is owing to their cultivation.

From information put into our possession, on the subject by Mr. George Anderson, of Lansingburgh, N. Y., and obtained by him from France, Belgium, Scotland, and Ireland we will present some facts to our farmers for preparing the soil for flax, so that those of them who intend to sow such crops this season may be benefitted thereby.

The best soil for flax is a dry, deep, rich loam, with a clay undersoil. It should be well drained, and plowed deep, using a subsoil plow. It is advisable not to grow flax oftener than once in seven years on the same field; it should follow a crop of oats which has succeeded one of potatoes; or follow wheat or rye, which has succeeded potatoes raised on broken up lea land. If the field is not drained—as is still the case with almost all our farms—the soil should be thrown into ridges, with deep furrows at the sides.

The middle or latter end of May is the best sowing time in the Northern States. After the ground is harrowed twice, it should be gone over with a roller, then dragged again with a harrow having fine, short teeth. The seed may then be sown, not across the ridges, but up and down, then harrowed three times, first up, then across the field, (angleways) then down the ridges, finishing with a light rolling. Generally speaking, our farmers do not pay sufficient attention to harrowing and rolling their fields; indeed, very few of them employ a roller at all. Every farm of one hundred acres should be supplied with three harrows—the angle coarse drag, a square harrow with a somewhat finer and a greater number of teeth than the drag, and a harrow with fine adjustable teeth closely set together.

Plump, heavy, shiny seed alone should be used, and care exercised in its selection.—American flax seed generally produces a coarse branchy stem. Dutch and Riga seed are held to be the best. If farmers wish to cultivate flax for fine fibre it should be sown thick, not less than two bushels to the acre, we believe; if for the seed, they should sow it thin—one bushel to the acre. Thick sown flax grows tall and straight, producing fine fiber, but little seed; thin sown flax grows coarse, and branches out, producing a great quantity of good seed, but coarse fibre.

As this is about the period when our farmers should sow their flax in the northern sections of our country, we present the above views for their consideration at present, and will, at some future period, direct attention to securing the crop and preparing it for market.

Applying the Waste Gases of Furnaces.

On page 180, this Vol., SCIENTIFIC AMERICAN, we described an improvement of Henry Weissenborn, this city, for utilizing the waste gases of blast furnaces, which has been successfully applied at the Eurioka Iron Works, Wyandotte, Mich. In that article we stated that Dr. Nott, of Schenectady, was the first inventor who attempted to save the waste heat of furnaces and apply it usefully.

A correspondent in the *United States Mining Journal*, this city, of March 8th, claimed the invention of Mr. Weissenborn for a Mr. Wilkinson, and stated that it had been in operation for some years in Western Pennsylvania. To these assertions G. Weissenborn returned an answer through the same source, in which he stated his brother had invented the improvement referred to in 1842. Thus far the correction was complete on one point. But this, it seems, has not satisfied all the correspondents of that journal, for another, signing himself "D," impugns our assertion in reference to the venerable Prof. Nott. Writing from Lynchburgh, Va., he says:—"Neither Dr. Nott nor Mr. Weissenborn are entitled to the credit of first using the waste gas of the furnace for the purpose of generating steam in the boilers used to drive machinery. The gas was first used in 1838, at the Catherine Furnace, near Fredericksburg, Va." The editor says: "The letter is from one of the most thorough and practical men of the age; one who well understands the mechanical arts in their fullest extent."

Before any person attempts to correct another he should be sure he is right. Davy Crockett, when he uttered the famous sentence "be sure you're right, then go ahead," gave vent to more practical wisdom than is to be found in whole volumes of some works styled "moral philosophy." The correspondent of the *Mining Journal* forgot Davy's maxim when he penned the above-named letter. Dr. Nott obtained a patent for utilizing the waste heat of furnaces and applying them for various purposes—among the rest, generating steam to drive machinery—on the 29th of June, 1833—five years before the date of such an application in the furnace at Fredericksburg, Va. No invention, so far as we know, dates behind that of the venerable Professor for the saving of such waste heat; and his improvement (which is now public property) is in extensive use, we understand, in Germany and England.

Clay and Iron Gas Retorts.

There are two kinds of retorts—iron and clay—employed in generating gas for illumination. It is a question of no small importance to know which are the best. A paper was recently read on this subject in the Institution of Civil Engineers, London, by J. Church, which contains some useful facts for gasmakers. Iron and clay retorts of the D form, 15 by 13 inches in cross section and 7 feet 6 inches in length, were tested together. The iron retorts lasted 365 days each, working off 1 1-2 cwt. of coal at one charge, and effected the carbonization of 262 tons of coal producing 9,000 cubic feet of gas to the tun. The clay retorts lasted 912 days each, and carbonized 6,665 tuns of coal; they also produced a greater amount of gas from the same weight of coal, owing to their more intense heat, but this gas was lighter, and its illuminating power diminished in proportion. It was found in some cases that the increase in the quantity of gas obtained in clay retorts over iron was not less than 2,000 cubic feet per tun of coal. The author of the paper stated that the cost of clay retorts was only 50 per cent those of iron; they saved 20 per cent. in setting, and they lasted two and a half times longer.

We understand that iron retorts are the kind in common use in most of our gas works, (not all,) therefore it is for their interest to adopt those of clay. It will also be of some service to the gas consuming public to know that while clay retorts are most profitable to gas companies, the gas made from them, "measure for measure," is inferior to that made in iron retorts. With the use of clay retorts, gas companies can afford to reduce the price of gas considerably.

Patterns of Printed Goods.

The styles and patterns of printed goods have their origin in the brains of artists who are employed for the express purpose of designing them in some establishments; there are also numbers of independent artists, who, like literary authors, execute patterns in their own domiciles, and sell them to those who pay the highest prices. In France and England new patterns of printed goods are sold in the same manner as copyrights, and it is thus that new patterns of such goods find their way into the market.

It is painful to persons of a fine taste to witness the miserable designs that are sometimes thrown into market and become fashionable for a time. The leaders of fashion have no choice in their production—they are beyond the compass of their skill—therefore those who produce them must be held responsible for the bad taste displayed. For a few years past the mass of such goods sold in our markets exhibited anything but a correct taste; last year, however, there was a slight improvement on former years, and we are happy to say that the new patterns of the present season display a still greater improvement.

The old *pine leaf*, first introduced from the East Indies, like a good old tune, never fails to please, because it is beautiful in its very nature; it is very prevalent in the new patterns we have noticed.

Iron Castings.

It is surprising how little attention has been paid to the use of cast-iron for fine castings of every description, not even excepting statues, and such like works of art. It is the cheapest of metals, and will stand exposure to the weather for ages with a coating of oil. Why then is it not more employed for such purposes? Why should it not take the place, at least, in a measure, of bronze, which is so expensive? Is it owing to anything in its nature whereby it cannot receive a clear impression from the mould in which it is cast? No. There is no metal superior to it for receiving a good impression from the mould. Cast iron expands in becoming solid, and therefore takes the impression of the mould with exactness. Its point of fusion is 3479° Fah.—a very high temperature—and this is one great objection to its use for casting statues and such works. With care and attention and proper molds, however, we are of opinion that iron castings may be vastly improved, and very fine works of art executed. We are but on the threshold of iron casting as an art. Our iron molders have a boundless field before them for the exercise of taste, skill and genius.

Salt Barrels for Preserving Apples.

We have received a letter from C. W. Cooke, of Waterloo, N. Y., in which a fact of great importance is related in reference to the preservation of apples. He purchased five barrels of choice apples taken from one pile, last autumn, and put them into his cellar. On the 1st of April last, when he came to examine them, those in four of the barrels were mostly all damaged, while those placed in the other barrel were sound—"fresh and good." What was the cause of the preservation of the apples in this barrel? Our correspondent says it was a Syracuse salt barrel, and had contained coarse salt, and he believes this was the cause of their immunity from rot. He, at least, can give no other reason. Neither can we.

Kentucky Mechanics Institute Fair.

The fifth annual exhibition of the above Institute will be held in Louisville commencing on the 18th of August next. Mechanics, manufacturers, and artists from all parts of the Union are invited to exhibit their inventions and manufactures. The past exhibitions of this Institution have been very successful, and were managed with great ability and honorable discrimination, and the next will no doubt be equally excellent. The exhibition committee consists of Geo. Ainslie, W. H. Dulaney and Wm. Kaye, who will make every exertion to aid contributors to display their articles to advantage. Those intending to exhibit at this fair are requested to communicate with the Actuary, D. McPherson, Louisville.

Statue of Washington.

A statue of Washington, sculptured in brown free stone, by the lamented Thom, has been erected in the park in front of our City Hall. The Father of his Country is represented above life size in a civil character, with his left hand resting on a globe, and a scroll in his right. The attitude is not very favorable, but the face expresses calm majesty and profound judgment. The features are not exactly like those represented in the portraits of Washington, but the artist has exhibited a profound acquaintance with physiogomy, for they indicate—according to this science—the highest traits of mental greatness, which is more than can be said of most of the pictures, and any of the other statues we have seen of him.

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Oil from Coal.

The manufacture of oil from rich bituminous shale and coal is now beginning to be a business of some consequence, and it will, we are confident, yet assume gigantic proportions. The materials for producing such oil exist in inexhaustible quantities within the bosom of mother earth, where they have been stored up for ages for the use and benefit of future generations. The discovery that oil could be manufactured from coal is one of the greatest made in the present century. Having had a number of inquiries made of us lately in reference to the processes for obtaining coal oils, the materials for making which are so abundant in our country, we publish the following description of the patent of W. Brown, granted in England, January 13, 1853, as containing valuable information for those who design to engage in this business:—

The first operation consists in distilling the coal, or other bituminous matter, in conjunction with steam, at a dull red heat; and, for this purpose, the coal or other bituminous matter is introduced into a retort fitted with a steam pipe passing through a furnace. The steam pipe terminates in the closed end of the retort, so that when the retort is charged with coal or other bituminous matter, and the furnace is in action, the steam pipe becomes red hot, and steam being then passed along it, in this state enters the end of the retort, and rapidly unites with and expels the volatile matters arising from the coal—by which means decomposition into gas is wholly or in great measure prevented, and the amount of oily or condensable product greatly increased.

The steam pipe may, if preferred, be passed through a furnace, distinct and separate from that which heats the retort, which arrangement admits of the withdrawal of the fire from the retort, or the diminishing of its intensity at pleasure, without altering the temperature of the steam pipe. By this means the distillation of the coal or bituminous matter can either be continued altogether or in part, with the retort at a temperature below that of a dull red heat. The steam pipe may be of cast iron, or it may be of clay or earthenware. In distilling, a condenser is employed, the temperature of which should not be lower than 50° Fah.

A quantity of volatile products having been thus obtained from coal or other bituminous matter, these are again subjected to distillation in a *still*, with or without the employment of a steam pipe, though the use of steam is preferred when a large amount of paraffine is required; but where the production of oil is the chief object, steam may be dispensed with. When steam is used, it is to be brought into the still, in a superheated state, by passing it through a red hot steam pipe, disposed in the furnace or flue of the furnace which heats the still. The steam enters through the upper part of the side of the still, and promotes, as before, the distillation of the volatile matters, whilst it retards their destruction or conversion into gaseous compounds. By this means the paraffine and heavy hydrocarbonaceous oils are preserved.

During the progress of the second distillation, the products vary at the different periods of the distillation; and these are therefore to be kept separate, or received in different vessels. At first a thin oil or impure eupione oil comes over to the extent of about one-eighth of the total fluid employed: after this a thicker and heavier oil, containing paraffine makes its appearance to the extent of from 40 to 50 per cent of the fluid employed; and lastly, a thick matter is evolved, consisting of paraffine, mixed with heavy oil; and this continues to the end of the operation, and constitutes about one-fourth of the bulk of the fluid originally used.

These three products are treated as follows The impure eupione oil is mixed with from 5 to 10 per cent. of its weight of oil of vitriol or sulphuric acid, to which an equal bulk of water is added; bichromate of potash is next thrown in, equal in weight to one-half of the sulphuric acid employed; the whole is then heated in any convenient vessel, of wood, lead or earthenware, and during the heating the materials are diligently stirred together. As soon as the temperature has reached 212° Fah., the heating means may be withdrawn, and the whole permitted to cool and settle.

The eupione oil is next to be decanted from the acid fluid, and treated with a warm solution of caustic soda, the whole being well mixed, and afterwards left at rest for some time to settle. Lastly, the eupione oil is decanted from the alkaline fluid, and distilled, either alone, or with water, or steam, as is practised with volatile oils generally. The heavy oil, containing paraffine, is next treated either with strong sulphuric acid and peroxyd of manganese, in the proportion of 10 per cent. of acid and 5 per cent. of peroxyd of manganese, or it is subjected, like the eupione oil, to the action of the sulphuric acid and bichromate of potash, in the same manner and proportion as indicated for the eupione oil; after which it is treated with soda ley, and allowed to settle. The heavy oil is then decanted and distilled in the usual way; the first portions being added to the eupione oil, as consisting chiefly of that substance; the second, and by far the larger portion of the whole, is received apart under the name "lubricating oil;" whilst the last portions, being thick and of the consistency of butter, are mixed with the impure paraffine, which results from the third stage of the second distillation of the crude products, which are next treated as follows:—Having allowed the impure paraffine to remain for twenty-four hours, or longer, in a cool place, to crystallize, the oily mixture is placed in a bag or filter, similar to those in use for the separation of spermaceti from sperm oil. When the oily fluid has drained away, the paraffine is removed to a press and subjected to severe pressure, as is practised with respect to stearic acid by the makers of that substance. It must then be melted, and when cold again pressed, the oil being in both cases added to the drainings, which are to be treated like "heavy or lubricating oil." The paraffine is then melted, and the heat raised to about 400° Fah., when strong sulphuric acid is to be carefully stirred into it in the proportion of from one-twentieth to one-tenth of the weight of paraffine operated upon. After boiling for a few minutes, the fire must be withdrawn, and the charred oil of the paraffine allowed to settle in the form of a black powder from the melted paraffine. This being separated, the paraffine must be boiled in water or in a weak solution of soda after which it may be cooled, and is fit for use.

This is a very clear description of the process. Considerable quantities of very beautiful oil for illumination and lubrication are now manufactured from Breckenridge coal in Kentucky, and sold in this city. A very large manufactory of mineral oil called kerosene is in operation a few miles from New York on Long Island, and large quantities of this oil are now sold and used. It is manufactured under three patents of Dr. Gesner, granted June 27, 1854.

A patent for making a lubricating oil from asphalt—like that obtained from the pitch lake of Trinidad—has recently been obtained in England by Dr. Simpson, (he who first applied chloroform as an anesthetic agent) of Edinburgh, and Prof. W. Thomson, of Belfast. The asphalt, according to their invention is first distilled at a temperature a little below that of a red heat. This produces a thick liquid, which is again distilled at the same temperature. The second distillation brings over a more limpid liquid—a fine residuum of charcoal being left in the retort. This oily liquid is subjected to stirring or agitation in a wooden vessel, with about one-tenth of its bulk of sulphuric acid. Much of the impurities unite with the acid, and when allowed to settle fall to the bottom of the vessel. The clear liquid is then drawn off, and agitated with a caustic alkali, or mixture of quicklime and chalk, allowed to settle, and the clear drawn off. The resultant oil is then agitated with sulphuric acid, as before, and again with the alkali or chalk, allowing time after each operation for the impurities to settle, and the oil has become a pale yellow color. It is then put into an iron retort and distilled at a moderate heat, when about one-third of the quantity comes over as naphtha. The heat is then elevated, when the remainder comes over (leaving but a small residuum of charcoal) and is an oil nearly limpid. It is not equal to many other oils for lubrication, but one part of sperm oil mixed with nine parts of it makes a cheap and good oil for machinery. As vast quantities of oils are now employed for lubrication, and as the demand for them must increase with the progress of machinery of all kinds, a knowledge of every new source from which a supply can be obtained is of no small importance.

A Cattle Plague.

In some of the northern parts of the continent of Europe a terrible plague has been raging for some time among the cattle, sweeping them off in hundreds. This disease is regarded as exceedingly infectious, as well as fatal, so that the most rigorous measures are adopted in every neighboring locality to guard against its approach, or to destroy the poison in the germ should it have made its appearance. It is recommended, as being the most effectual means, to destroy every affected animal, and to bury or otherwise destroy the carcasses—the hides being immediately tanned and the houses purified with chlorine. There appears to be two varieties of the disease, one called the Pulmonary Murrain, the other and more fatal, Steppe Murrain. The first stage of this disease is attended with a dry short cough, which may exist for several weeks. In the early stage the animals may be cured, but other stages follow, the symptoms of which resemble those of the Steppe Murrain, and end in a similar manner, the lungs exhibiting an indurated appearance and an entire change of structure. The fears excited that this disease might spread to England, has led to the issuing of a proclamation by government forbidding the importation into the United Kingdom of cattle, horns, hoofs, and raw or wet hides, or skins of cattle, which shall come from, or shall have been at any place within the territories of the Emperor of Russia, the King of Prussia, or of the Grand Duke of Mecklenburg-Schwerin, which respectively are in or border upon the Gulf of Finland, or any other part of the Baltic Sea between the Gulf of Finland and the Free City of Lubec. We hope this plague will not spread among the cattle of different countries, like the cholera among the human race.

National Hotel Disease.

One of the many intelligent sufferers by this disease, a distinguished patent attorney, writing us on the above subject, ascribes it to an effort on the part of the negroes to destroy the whites, a theory to which we attach no importance; but his sketch of his symptoms may be valuable, as he was not at the National Hotel at all, but only at Brown's, a building almost adjoining. He made two visits, the first of no importance in this respect, but the second, some six weeks after the National had been closed, was attacked in four days by sickness, so that he started at once for home. This was on Wednesday. He says:—

"I suffered very much on the way with pain in the intestines and limbs, nausea, violent headache, chilliness, a soreness of the throat, and soreness of the stomach—at times nearly fainted from prostration; on the next day diarrhea set in with soreness of the intestines, and by Sunday I found that the coating of my stomach and intestines were coming away with the diarrhea, my liver and chest began to pain; also seemed as if inflammation and swelling were going on. Not until this time did I suspect that I was poisoned, and on sending to my physician, Dr. C. Hering, he at once (and since) pronounced the symptoms those of poison by arsenic, and administered the antidotes for arsenic. On Tuesday, at noon, I began to feel better. Have continued taking homopathic preparations of iron, antidotes to arsenic ever since, now for more than a week, and I am slowly recovering.

My physician and his colleagues have had a number of cases in Philadelphia, all from the National Hotel, of the same symptoms of arsenic, though my case was the most violent of any."

With regard to the mystery of the matter, we may remark that Dr. T. C. Jackson, of Boston, in a letter published on the subject quite recently, ascribes the sickness, as do many others, to effluvia, arising from the drains. Persons who slept at the Hotel, but who took their meals elsewhere, were affected while others who took their meals at the Hotel were not affected. If the cause of the sickness was poison introduced into the food, how are we to account for these contradictory cases; or again, if it were due to anything connected with that house alone, how shall we account for the sickness of our correspondent, who has perhaps never been inside of the National, at least not for many months?

Shark and Whale Oil.

The Liverpool Chemists' Association have had under their examination some samples of shark oil, procured from sharks caught on the coast of Africa, and which was found to possess some characteristics of peculiar interest. Hitherto sperm oil possessed the lowest specific gravity, ·875, and was the lightest known; but shark oil is found to have a specific gravity of only ·866.

The following is a good method of purifying common whale oil—it is put into an iron still, with one ounce of sal-ammoniac and a pint of turpentine to each gallon, and heat is applied to the still, and the contents stirred by a rod passing tightly into it during the period the distillation is going on. The oil that passes over is stated to be peculiar in its character, and of a superior quality.

Water Hygiene.

"The tanks for water in India are covered with a green weed," says the India *Annals of Medical Science*, "and this, at the same time that it imparts a greenish hue to the water, possesses a remarkable power of filtering it, and rendering it wholesome, for where you have this green weed you also find small fish and infusoria, which preserve the water also. Sir Charles Napier, inspecting the hill districts of the Panjaub, observing the Bheestees drawing water from one of these tanks, ordered it to be immediately cleaned. The water soon became offensive, and was unfit for use until the same weed was replanted and had again covered the tanks."

Increase of English Factories.

During the past year, according to the Report of Inspectors of Factories, there has been a considerable increase in the number of such establishments. Altogether there are 2,210 cotton, 1,505 woollen, 525 worsted, 417 flax, and 460 silk factories in the three Kingdoms. The cotton factories had increased 1·42 per cent, silk factories not less than 66 per cent. 33,503,580 spindles were in operation, and 369,205 power looms, for all the factories. In 1836 there were only 115,801 power looms running; thus in twenty years they have tripled in number. There are employed in these factories 46,071 children above ten years of age and under thirteen, 460,646 women, and 176,400 men; total, 682,517 persons. That country is certainly progressing of late.

Patent Cases.

India Rubber.—No less than four cases of this elastic article came up before Judge Grier, Philadelphia, on the 7th inst. These were applications for injunctions by the Congress India Rubber Co., located in New York, to restrain four mercantile firms in Philadelphia from selling shirred goods, which, they claim, is an infringement of Goodyear's patent, owned by them. All the motions for injunctions were postponed. One of the firms sold English shirred goods, which, it seems, are cheaper than the same kind of American-made goods. We had supposed that our manufacturers were able to undersell those of England.

Strychnine in Whiskey.

The use of strychnine in the manufacture of whiskey is henceforth to be punished as a felony in Ohio. By means of this drug, used in connection with tobacco, some distillers were making five gallons of whiskey from a a bushel of grain, whereas the quantity obtained by the old process was but two and a half gallons. So it is said.

The Pacific railroad through Texas will be eight hundred and eighty-three miles long and has a grant of eight millions and seventeen thousand acres of land, and a loan of six thousand dollars per mile from the State.

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J. R. N., of Mass.—Some short articles on improvements in agriculture would be acceptable. Our field of discussion is the whole circle of arts and sciences—new and useful improvements especially.

J. G., of L. I.—There are several Patents on hydrants, in which the inventors claim that they are proof against the action of the frost, but we think there is considerable room for improvements in this class of inventions yet.

W. & C., of Pa., wish to know where the metal aluminum can be procured in this country, and at what price?

R. C. M., of S. C.—The idea of sending written messages through a tube by means of atmospheric pressure is not new. Thirty years ago this plan was seriously talked over by men of science in Scotland, and subsequently several modifications have been proposed. Richardson had some ingenious modifications of this old system, but was not its first inventor as you suppose. Paper has been made of grass and also of corn stalks. Patents could only be procured for certain processes employed in the manufacture and not for the use of this article itself.

C. C. of N. Y.—There appears to have been no movement made by the Canadian Parliament to reform its odious Patent system; therefore you are evidently deceived in reference to the matter. We shall be glad to hear of the adoption of some system there which will open the way to the introduction of American improvements. A little more liberality in this matter would benefit the resources of Canada very much.

A. J. C., of Md.—In the course of our experience we have often met with just such cases as yours. If you had spent $50 or $60 at the time you first made your invention in procuring a patent for it, you would not now be mourning over the fact that some one else is making money out of it. If you have no proof to sustain your claim to the originality of the invention, you have no remedy against the present patentee. While you have been shaking the bush some one else has caught the bird.

R. A., of Ohio.—Our office at Washington gives careful attention to the examination of inventions with reference to their patentability. If you wish us to examine your device, we will do so upon receipt of a sketch and description of it. You cannot procure a Patent on the composition you describe for making a cement roofing. West's Patent covers the same combination of ingredients.

C. E. J., of Mich.—Whenever you succeed in lifting yourself over a fence in a basket by grasping the handles, then we shall not dispair of success with the "perpetual motion." Many ingenious men have wasted much of their valuable time over this phantom. They have many times "discovered it without mistake," but have always been snagged whenever they have attempted to reduce their wild theories to practice. Take our word for it the thing is impossible with man.

J. F. G., of Mass.—Dick's Practical Astronomer will give you full instructions respecting the polishing of achromatic object glasses, specula, &c. We cannot tell you where you can procure rough disks of flint glass.

D. F., of N. Y.,—Neither sand, clay, ashes, fine brick, nor gypsum are good heat conductors, iron is the cheapest conductor. An article patented in England can be patented here by the first inventor, whether he is, or is not, the foreign patentee.

S. K. B., of N. H.—The average power of overshot water wheels is 70 per cent. The Lowell turbines, it is stated, average 80 per cent, of the water power.

T. C., of Ohio.—We are not acquainted with the operations of the Goodwin's Water Wheel, mentioned in your letter. The turbine of Mr. Munroe, illustrated on another page of the present number will answer well for you, under a six foot head.

M. B. F., of ——.—Canadian balsam is the gum of the pine species, *abies balsamea*. The balsam of fir is a similar resin.

G. D., of Ill.—There is no law requiring an inventor to put his name on a machine of his invention, constructed before he obtains a patent for it.

W. T., of Conn.—Chloroform has never been applied to kill whales, and we presume never will. A gallon of it would produce no greater effect upon a monster of the deep than the same quantity of whiskey.

H. R. R., of ——.—Tarred rope is made by running the strands through a box containing hot tar.

T. W., of Tenn.—We do not know what case you mean, as being litigated between McCormick and Manny, respecting their reapers. You will find a decision given in one case between these two patentees on page 235, of our last volume.

H. P., of Ky—Your views in regard to the moon's rotation on an axis of its own, in reference to the planets, is the same as those we have already expressed on the subject.

E. B., of N. H.—We do not question the correctness of your statement in reference to the operations of a divining rod; but until we witness similar results it will be difficult to alter our opinions regarding its efficacy.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, May 9, 1857:—

W. L. B., of Vt., $25; D. J., of Me., $30; S. G. of Mass., $30; J. W. C., of Ky., $20; D. C., of Pa., $30; A. F. A., of Conn., $30; J. A., of Mich., $55; H. & S., of N. H., $20; G. L. C., of N. Y., $25, T. B., of N. Y., $30; G. B., of N. Y., $30; F. B., of Conn., $25; J. C. S., of Mass., $10; P. B., of N. Y., $250; O. D. W., of Pa., $200; D. S. D., of N. Y., $20; T. M., of Pa, $25; L. E., of Mich., $30; H. B. L., of O., $25; H. N. T., of N. Y., $25; S. & Y., of Ill., $30; G. S. C., of Ill., $35; T. S., of Pa., $57; J. E, of N. Y., $30; B. & Van P., of Wis., $25; C. P. C., of Mass., $25; P. H., of Ill., $30; W. M., of La., $30; L. B. S., of N. Y., $32; J. C. M., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 9, 1857:

S. B., of La.; G. L. C., of N. Y.; D. J., of Me.; K. & G., of Ill.; W. L. B., of Vt.; F. B., of N. Y.; J. C. M., of N. Y.; H, B. L., of O., A. W., of Pa.; T. M., of Pa.; C, A. P., of N. Y.; H. N. T., of N. Y.; B. & Van P., of Wis.; C. P. C., of Mass.; N. J., of N. Y.; J. E., of N. Y.; L. B. S., of N. Y.; J. F. P., of N. Y.; E. C., of Mass.

Literary Notices.

THE ECLECTIC MAGAZINE for April contains a fine picture by Sartain of the late Dr. Kane, which is said to be the best likeness of that eminent man yet published. It is certainly a very beautiful production, and does credit to all who have had a part in its preparation. Accompanying the portrait is an eloquent article upon "Dr. Kane's Arctic Explorations," which have so closely fastened his memory upon the hearts of his countrymen, and we may say of the whole world. The Eclectic Magazine is published every month by W. H. Bidwell, No. 5 Beekman street, New York, at $5 per annum. It is made up of the choicest selections from the ablest European periodicals, and is a work of great merit. We recommend it to the patronage of our readers.

THE YOUNG MEN'S MAGAZINE, conducted by Richd. C. McCormick, Jr., has made its appearance, having chosen for its motto, "*Droit et Avant!*" It has a choice and varied collection of original and selected matter, which cannot fail to recommend itself to that class for whose special benefit this magazine is intended. We wish it much success. Terms, $1·50 per annum.

Important Items

☞ COMPLETE SETS OF VOLUME XII EXHAUSTED.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers previous to No. 27 are entirely exhausted.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

PATENT LAWS AND GUIDE TO INVENTORS.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis at this office upon application by mail.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the next volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

Subscribers to the SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

☞ All advertisements must be paid for before inserting.

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had ELEVEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

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THE SUBSCRIBERS are constantly manufacturing and keep for sale, particularly adapted to the use of Machinists, Pattern Makers, and nearly all kinds of mechanics, cast steel Try Squares, cast steel Scales, with straight edges, cast steel Beveled Straight Edges, cast steel Yard Sticks, for sheet iron workers, carriage trimmers, &c., cast steel Thin Straight Edges for draftsmen, and a superior scale for Architects and Engineers; also combined Gage and Callipers, an excellent article for machinists. These tools took the First Premium at the late Fair of the Franklin Institute, and are approved of and used by the Mechanical Department of the Government at Washington. We warrant them far superior to any other tools of the kind, either of American or foreign manufacture. Liberal discount to dealers. DARLING & SCHWARTZ, Bangor, Me. 36 4

IRON FOUNDRY Machine Shop and Fixtures for sale or to rent. Location unexceptionable. For particulars address J. D. PAYNE, Wutkins, N. Y. 33 3*

$300 WANTED by the subscriber, to perfect a valuable invention, on which a caveat has been secured. The drawings are made, and the above sum is required to pay for making a machine and model. An equal interest will be given to any one who will advance said sum. For particulars, address C. A. BEAL, Roxbury, Mass. 1*

GROOVING PLANE for Pattern Makers and Carpenters—Will work any core box or circle very quick and true, from 5-8 of an inch to 3 inches, tapering or straight; price $2·50. Address JOHN P. ROBINSON, Matteawan, Duchess co., N. Y. 1*

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$1,000 FOR A VALUABLE consideration we have furnished to J. R. STAFFORD, Practical Chemist, 16 State st., N. Y., a selection of one hundred of our Choicest Receipts for Cooking Baking, &c., the same being in constant use in our Hotel. The receipts selected are those which are the best adapted to the use of private families. SIMEON LELAND & CO. Metropolitan Hotel, Broadway, New York, April 6, 1857.

The above receipts have been added to J. R. Stafford's Family Receipt Book, which now contains more than 250 of the most valuable receipts that have ever been published. The above book also contains a chart 23 by 33 inches, on which are 24 splendidly engraved Anatomical Illustrations of the Human Body. This magnificent chart should be hung up in every family setting-room. The Book and Chart will be sent free of postage on receipt of 12 cents or stamps, by J. R. STAFFORD, Practical Chemist, 16 State st., New York. 36 2*

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MOUNT HOPE IRON COMPANY CUT NAILS. The attention of dealers and shippers are requested to this new and superior brand of Cut Nails, made at entirely new works, with latest improved machinery. They are excellent in shape, finish and quality, for sale by the Company's agent, JOHN W. QUINCY, 98 William street. 29 8*

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NEW HAVEN MFG. CO.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 27 tf

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Science and Art.

Cultivating Potatoes.

The following statement is from a farmer who has been eminently successful in producing this crop:—

"In the first place I plow deep and harrow, and then make the drills by running the plow each way in the same furrow in order to make it as deep as possible, then draw manure, consisting mostly of refuse cornstalks that have been fed to cattle and horses, and spread in the furrow, drop the potatoes and cover; the after culture being the usual practice of cultivating, plowing, and hoeing. This method has never failed to produce good potatoes in a dry loamy soil."

During the past few years our farmers have generally failed to produce good crops of potatoes, hence such esculents have sold at enormous prices. They have not paid sufficient attention to their cultivation; let them devote more care this season. English, Irish and Scotch potatoes of very fine qualities have been imported into New York for two years past. This should not and need not be if our farmers bestir themselves.

The Louisiana Sugar Crop.

According to the latest accounts, the damage by the recent frosts in Louisiana has not been so great as to diminish the productiveness of the cane essentially. At first a material curtailment of the crop was predicted. No doubt the young cane was severely bitten, but as a general rule it promises to regain its vigor, or at least to a fair proportion of saccharine juice. Cotton and corn being less hardy, have suffered to a greater extent; but the damage is more easily repaired by replanting, and in this work the planters are busily engaged.

The condition of the Louisiana sugar crop has become an subject of general solicitude; and we therefore hope that the yield will be good this season. It is reported that the cuttings obtained by the special vessel sent to the West Indies by our Government at so much expense have mostly proven worthless.

Blacking for Horse Harness.

Melt four ounces of mutton suet with twelve ounces of beeswax, and twelve ounces of sugar candy, four ounces of soft soap dissolved in water, and two ounces of indigo finely powdered. When melted and well mixed, add half a pint of turpentine. Lay it on the harness with a sponge and polish off with a brush.

This blacking is for working harness, which should be cleaned and polished up at least once per week when in constant use.

The following is a recipe for carriage harness blacking:—

Take three sticks of black sealing wax and dissolve them in half a pint of alcohol, and then apply with a sponge. Lac dissolved in alcohol, and colored with lamp black, will answer the same purpose. This is a quick drying, hard varnish, liable to crack the leather, and should therefore be put on as seldom as possible.

Improved Cock for Basins.

On the 3d of March last a patent was issued to Robert Leitch, of Baltimore, Md., for the improvement in cocks represented by the accompany figures, 1 and 2, a perspective and sectional view. The parts and operations of this cock are very simple, as the following description will render evident:—

A represents the stem; B is a globe having the spout, E, on it. This globe turns on the stem to let in and shut off the flow of water by raising and depressing a stop piece, C. The periphery of this stop piece or valve is chased with a short right screw thread; the interior of the globe, B, has a short left screw on it, meshing with the thread of the stop piece, C. A shoulder or square spindle, F, is secured in the top of the stem piece, A, and extends up through the inside of the globe piece, B. The screw piece, C, has a square central opening and fits on F, and is free to be raised up and forced down. A thread is cut on the top of shoulder, F, and when the globe piece, B, is fitted on, with the stop piece, C, inside on its shoulder; by screwing the small top cap on that of the top of shoulder, F, the globe is secured firmly in its seat. A series of small holes, D D D, through the top flange of the stem, A, communicate with the interior of the globe, B, and when the stop piece is raised the water flows out of them through the spout, E.

Operation.—By simply turning the spout, E, with its globe around in one direction, the thread on the inside of the globe raises the

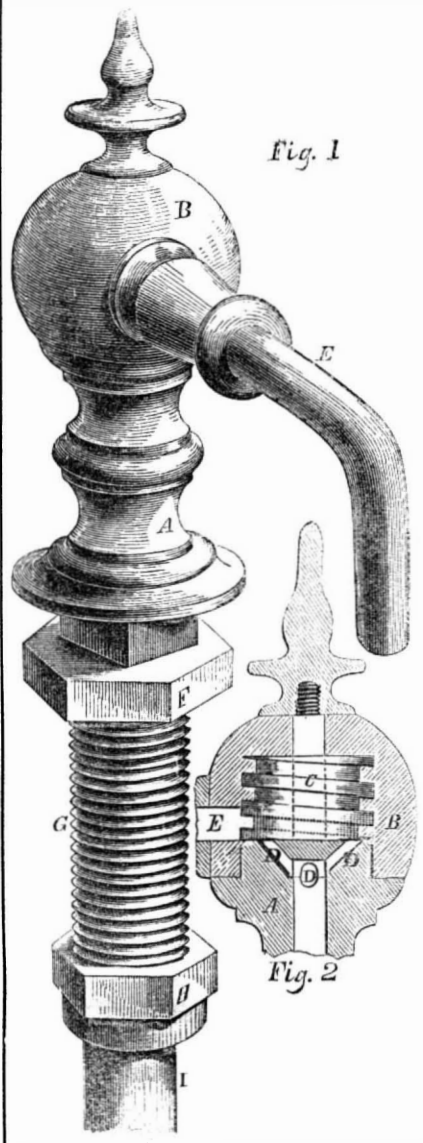


Fig. 1

Fig. 2

stop piece, C, (not turning it) on the shoulder, F, to the amount of the pitch of the screw (as shown by dotted lines) when the water flows up and out of the spout; by turning the globe in the contrary direction, the stop piece, C, is forced down on its seat, and the flow of water is shut off.

The claim is for the arrangement of the loose stop piece, C, with a thread on its periphery, and the means of raising and depressing it vertically without its turning, as described.

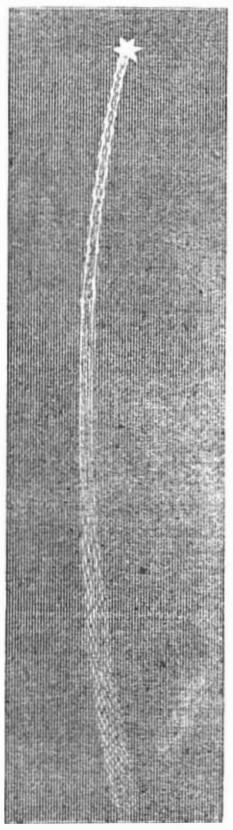
F G H and I represent nuts, a screw, and an extension piece of the stem for fitting it into its place and position for use, and are of the usual construction. Stud pins on the inside of the globe, B, fitting into the thread of the stop piece, C, will also operate the stop piece. This is a very convenient basin cock; it opens and closes with a quarter turn of the globe, it never gets hard to turn, is very durable, and not liable to get out of order.

More information may be obtained by letter addressed to R. Leitch, care of Register & Webb, 53 Holiday street, Baltimore.

More about Comets.

The comet of 1843 was in several respects the most remarkable which has ever been recorded. Most of our readers saw this comet, or rather the streak of light forming its tail, which streamed nearly half way across the sky. This comet appears to have approached the sun on the side opposite the earth, so that like a skillful hunter approaching his game, it was not seen until it appeared in very close contiguity to its surface, and so bright that it was seen in the day time by different observers on all parts of the earth. Its existence was not suspected at any of the observatories until it had passed its perihelion, and was rapidly retreating again into darkness. At some period during the early portion of its visit, it would seem that it must have swept across the face of the sun like an eclipse, and we can hardly forgive the sleepy savans for neglecting to detect this extraordinary event,

FIGURE 1—THE COMET OF 1843.



as it would have afforded so fine an opportunity to note exactly the degree of transparency of all parts of its nucleus or head, which they subsequently decided was 36,000 miles in diameter. Its tail was at one time 108,000,000 miles in length, considerably more than the whole distance from the earth to the sun. At its perihelion passage or point of nearest approach to the sun, it must have almost or quite grazed against its intensely fiery surface; in fact, the plain and unvarnished results of some of the careful calculations made, would imply that it had actually entered its substance. It retreated so nearly directly from the sun's center, that some observers were at a loss to decide which way it had passed around.

Comets are attracted by, but do not in return produce any sensible attraction on any of the planets or their satellites, near which they pass. But a more intensely overwhelming proof of the tenuity of comets is the

FIGURE 2.

fact that in several instances stars which have been in their path, have been observed to shine dimly through the thickest portion of their substance. It cannot be said that this has been observed with regard to the brightest central point of any large and very brilliant comet, but several instances have been observed where the cometary mass, distinctly ascertained to be several thousand miles in

FIGURE 3.

diameter, has passed over clusters of minute stars, all of which latter have been distinctly seen throughout the whole period of its passage. Some comets are supposed to have a small amount of solid substance, as a nucleus, but the great mass must be composed of something far less dense than cloud, or even than the ordinary gases of our atmosphere.

Many comets exhibit indications that the luminous portions are supported on the surface of cloudy or or simply transparent atmosphere below. The nucleus, or head of a large comet, is usually light at the center, surrounded, especially on the side towards the sun, by a luminous cap, as shown in fig. 2, which can only be explained by supposing the nucleus to be enveloped at a considerable distance in a light cloudy covering, which is most plainly visible at the edges, where, by looking edgewise through the sheet, a greater depth of light becomes visible.

In some instances there appear indications of several distinct layers of light, which are represented somewhat exaggerated in fig. 3. It is probable that some of the ancient comets which are recorded as having several distinct tails were thus constructed, and that the tails were but extensions of the envelopes.

Berdan's Bakery.

The mechanical bakery of H. Berdan, in Brooklyn, which has been noticed in our columns, was burned down on the 7th inst. It is stated to have been very successful, baking from 75 to 100 barrels of flour per day.

New Steamer.

A mail steamer, to be called the *Scotia*, is now building in Glasgow, to run between Liverpool and the United States. She will be 450 feet in length, which is 60 feet longer than the *Persia*, at present the longest ship afloat.

The Supreme Court of Illinois has decided that animals wandering on the track of an inclosed railroad are strictly trespassers, and that the company is not liable for their loss when on the track, unless its employees are guilty of wilful or wanton injury, or of gross negligence, evincing reckless or wilful mismanagement.

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